The Builder.

VOL. XXXI.—No. 1571.

Early French Goldsmiths' Work, Trinkets, Vestments, and Weapons.

SINCE the terrible siege of Paris, M. Viollet-le-Duc has issued four more parts of his voluminous *Dictionnaire Raisonnée du Mobilier Français, de l'Époque Carlovingienne à la Renaissance.*

It is now about fifteen years since the first volume of this important French work was published. The first instalment, as we informed our readers at the time, was apportioned to furniture. The old French châteaux, museums, sacristies, and manuscripts were ransacked and scrutinised to show us the ancient household furniture of the old kings, nobles, and burgesses of France in the eleventh, twelfth, thirteenth, and fourteenth centuries, successively; and a most interesting array of facts was grouped together, which, bearing in mind the close association of France and England in those old times, is of as much consequence to the English antiquary as to his Continental neighbour. After an interval of ten years, the first *fascicule* of a second volume appeared, in which ancient French utensils were illustrated and described. We gave our readers some account of the contents of this part of the work also. The crystal and silver and gold vessels that stood upon the dressoirs, and formed the treasures of princes, figured in this collection, among other costly objects. Miniature ships, equipped with sails and crew complete, that stood upon the banquet-tables, and contained spices and condiments; the candelabra; the drageoirs to hold sweetmeats; lamps that swung down over the centres of beds to keep away evil spirits at night; lanterns; queer snuffers, like birds, that opened their beaks to snuff off the wick that required removal; mirrors, when they were so small they might have been carried in the pocket; plates, when they were so rare as to be given as love-gifts; squirts, when they were used to extinguish fires; fans; spoons, before any one thought of placing the twelve apostles on the handles; and about 160 varieties of objects of a similar class, gave page after page nearly equal interest.

After two more years, the second volume was completed by two more *fascicules*, containing treatises on goldsmiths' wares, musical instruments, games, pastimes, and tools. The specimens of goldsmiths' work begin with what is left of the famous golden retable said to have belonged to the oratory of Charlemagne. This is the ornament which formed the summit of it, consisting of an *aigue-marine* intaglio, representing Julia, the daughter of Titus, surrounded by nine large sapphires, framed in gold, seven of which are surmounted by large pearls, fixed in their places by golden cups affixed to the gold mounting of the sapphires. The golden chalice of St. Remi, which from Rheims passed to the treasury of St. Denis, and was thence transferred, in 1796, to the National Library, and since then deposited in the treasury of Rheims Cathedral, is the next object upon which the peculiarities of early workmanship are pointed out. Some antiquaries suppose that all early goldwork of worth is of Byzantine origin; but M. Le Duc thinks that even before the time of Charlemagne there were goldsmiths in the Western world who were acquainted with the art of soldering as well as of casting, and whose work was of a high order. The end of a belt found in an old battle-field, near Poictiers, and supposed to have belonged to one of the chiefs beaten by Charles Martel; the reliquary of St. Sixte and St. Sinice, in the treasury at Rheims; a ciboire, or cup and cover, from Sens Cathedral; a twelfth-century Pascal candlestick, are further selections of early work shown us. M. Le Duc points out the prevalence of granulated threads of gold soldered to a foundation by means of filigranes of solder in twelfth-century work; and the gradual enrichment which took place in the thirteenth century, when the goldsmiths, trying to give more lightness and brilliancy to their work, raised their coils of granulated threads from the foundation and soldered several of them together to form spiral designs. Our British Museum, we may remark, is rich in early work of these times. The ancient process of enamelling upon metals, translucid and opaque, is well described. It is illustrated by a Merovingian buckle and clasp, a Byzantine box, the Rheims chalice, and the superb enamel of Geoffrey Plantagenet, now in the museum at Mans. This last work is one of the largest known. It represents Geoffrey standing up, holding a sword in his right hand, and a large shield, charged with four leopards, in his left. On his head is a pointed cap showing a lion *passant d'or* on azure; and he is robed in a long vestment, like that which nobles wore in the middle of the twelfth century. The figure stands out of a background divided into parts by a green open pattern, in every compartment of which are blue and white flowerets upon a gold ground. Green, blue, and white are so managed as to give a very harmonious richness to this work; and M. Le Duc contends that a performance of this extent and perfection could not be the result of an industry then in its infancy. Another specimen of enamel-work is from the tomb of Prince John, the son of St. Louis. The workmanship of the Limoges enamellers is represented by the *ciboire d'Alpais*, now in the Louvre, round the lip of which runs the legend,—"*Magister: G: Alpais: me fecit: Lemovicarum.*" Another beautiful object shown us in its full colours is a crozier of copper, gilded and enamelled, belonging to Sens. Dwelling upon the beauty of these works, M. Le Duc remarks,—"All cannot possess silver plate, bijoux of gold, ornamented with precious stones, furnitures of precious woods, and vestments of velvet; but all, however modest their fortune, can possess objects invested with distinguished forms; for art is independent of luxury, and as free of it as a master is of his slave; and an earthen pot by its aid may be made more precious than an ugly vase of rock crystal, mounted in gold."

We may look upon the archæology of tools as almost a new shoot from the great tree of antiquarian knowledge; for although pre-historic studies have brought stone, flint, and bone tools into prominent notice, those of the Middle Ages have been but little mentioned. For information concerning them our author has been obliged to turn to ancient MSS., stained glass, tapestry, carved woodwork, and sculptured stonework. We have collectors of many kinds of "unconsidered trifles" nowadays, but collectors of tools, otherwise than pre-historic, are rare. M. Le Duc has a few examples in his own possession. He begins his list with the *auge*, or receptable to hold mortar and plaster. The most ancient monuments show that the masons of yore carried this upon their heads, and that they formed it out of a length of the trunk of a tree, halved and hollowed out: it was used even down to the fifteenth century. The accompanying trowel does not differ in shape from that in use. The auge is not to be confused with the hod, which is to be seen, also, on early basreliefs, furnished with two short handles, instead of one long one. *Bâtons*, clubs, or sticks, for which there are twenty-one different names in old French, have as many forms and purposes as they have designations. Brooms were always as we have them now. Spades, *bêches*, shown in the tapestry of St. Médard de Paris, are made of wood, with the shovel protected with iron on both sides from the shoulder downwards in one case, and from halfway down the side in another. Those in use in the thirteenth century were constructed on such a clever principle that M. Le Duc cannot see why that particular make was ever abandoned. A figure from this same tapestry shows a carpenter with his tools. A hatchet rests on his shoulder, a coil of rope is wound round and round his neck, and from his leathern belt hangs a hatchet, a pair of compasses, a large purse, an axe, and a twy-bill. If it were not for his trunk-hose and the shape of the axe, we should see no great difference between him and any carpenter busy with his work in the present day. Shakspeare opens his play of Julius Cæsar with a remark from Flavius to the rabble of citizens present, to the effect that being mechanical they ought not to walk upon a labouring day without the signs of their professions, and turning to one he asks, "Speak, what trade art thou?" When the man replies he is a carpenter, Marcellus chimes in with, "Where is thy leathern apron and thy rule?" Neither of these signs of profession appears in the carpenter here delineated. One of the stalls in the church of Montréale (Yonne), of fifteenth-century workmanship, shows another member of the same craft at work. He has a piece of wood before him on his bench, held by a hold-fast (*valet*), into which he is inserting a long-handled gouge. Behind him are several chisels suspended to the walls, an auger, and a hatchet, none of which are very different from those in present use. M. Le Duc, however, shows us a pair of callipers in which there is a very material difference in the form. The legs first cross each other and then bow out in reversed curves. These are to be seen in basreliefs on the stalls in Poictiers Cathedral, in Chartres Cathedral, and in vignettes of the thirteenth and fourteenth centuries. We are also shown two smiths at work. Both wear leathern aprons, and on the head of one is a felt cap, which projects over his face and depends over his ears, so as to protect them from sparks and the intense heat of the furnace. Smiths' work was in every-day requisition in the Middle Ages, either in the armoury or workshop, and great facility was arrived at in the management of iron. Anvils were made of various forms, some flat and square, some with inclined faces, and some had one or two horizontal cones projecting from them suitable for rounding pieces of iron. Passing on to the plane (*rabot*), M. Le Duc has not found any examples of this tool figured before the middle of the fifteenth century, although from the evidence of work, it must have been in use at a much earlier date. The *rabot* of the fifteenth century is furnished with a vertical handle as a prow, which facilitates the pushing, or moving of it. It has not, like ours of to-day, its two sides parallel, but bowed, so as to sit better on the wood to be planed. The planes were made of pear-tree wood, of elm, of maple, and fashioned with great care. The long plane (*varlope*) employed to dress very long and slender mouldings does not appear figured on monuments before the sixteenth century.

The long leisure, the long winters, the distances,

the bad seasons, and bad roads made many a dull hour in the old châteaux. When there was no warfare going on, there remained but the chase, fêtes, jousts, tournaments, and assemblies to pass away the time; and it often happened that a nobleman or gentleman would live in the midst of his family without receiving news of the world without for a long period. When a troubadour, or a pilgrim, or a messenger arrived it was an event; he was entertained in the best manner, and if he amused the chatelain ever so little he was loaded with presents to induce him to remain or to return. A few remarks showing the unlettered baron of the Middle Ages thus isolated for at least six months in the year serves M. Le Duc as a prelude to the diversions of old times. His account of tournaments, plan of the lists, illustrations of knightly armour and weapons, the caparisons of horses, presentation of prizes, are as interesting as those relating to the chase with its dogs and hawks, or the dance with its flowers, summersaults, sword-dances, bell-dances, and other dances of which our country-dances are but traditions. But we pass over these to subjects coming more directly within our scope.

The third volume, which is appropriated to jewelry, garments, and articles of the toilet, commences with the clasp, *agrafe*, or fastoning, by means of which the two sides of a garment could be united on the wearer. At least a hundred different forms of these articles have been found. The tombs of the German chiefs, who invaded Gaul in the fifth century, have furnished several, both in silver and gold. A round silver clasp, composed of two plates riveted together with an intervening border an inch wide, and ornamented with coloured glass, arranged in a pattern, discovered at Odratzheim, near Strasbourg, in a tomb, is shown. An agrafe, with the name of Christ engraved upon it, found in a Merovingian cemetery, is the subject of another illustration. And there are ten other examples figured. These clasps were always worn upon the right shoulder, to allow the right arm to be free between the two borders of the mantle. As we turn over the pages of the three *fascicules* forming this volume, object after object arrests the hand. But as we cannot enumerate them all, we will pass on till we come to the bags or reticules, that were once almost universally worn slung from the belt. In the first place there was the *aumonière*, which was a small bag, fastened with knots and clasps, and slung from the waist, to contain small objects in constant use, and money. From the twelth century to the fourteenth, this was an indispensable article of the daily raiment of both sexes, either at home or abroad. The earliest form is that of a small square bag, with two cords to close it with, and another to open it and suspend it with. There are three ancient *aumonières* in the treasury of Troyes Cathedral. The earliest, which appears to date from the end of the twelfth century, is embroidered by hand, upon canvass, in bright colours and gold, with a lively design divided into octagons, in the centre of each of which is a bird, animal, or conventional flower. It is bell-shaped. It opens in the centre of one side, where the aperture is strengthened by an iron ring. All round are small balls and tassels of gold thread. This is illustrated. The second *aumonière* is supposed to have belonged to Henri le Libéral; the third is attributed to Comte Thibaut IV.; both are embroidered by hand, with something like valentine subjects. The last has the additional interest of being associated with the sentiments Count Thibaut entertained for Queen Blanche. On the upper part of this *aumonière* there is embroidered a lady sleeping on a bank of green turf, under the branches of an oak, whilst a winged youth is admiring her. On the lower part two ladies are dividing a heart that is on an altar before them, while a hand, armed with a hatchet, issues from a cloud, and takes aim at the saw with which they are conducting their operation. The allegory is of doubtful taste, M. Le Duc admits, but quite in keeping with the tastes and pranks of the age; and the execution of the figures is most admirable. Many had clasps, like the bags in use by excursionists and others at the present day. Then there were purses for coins and relics, which, instead of being slung from the belt, were passed under it, and kept safely in that position by straps or cords. This custom of suspending purses by the neck, as it were, and in sight, explains the mode of operations of thieves, which led to the employment of the term "cut-purses" for them. There was still another kind of bag, which was, however, in use only among persons of rank or fortune. This was destined to contain the book of devotions, for the purpose of carrying it to church. It was furnished with a loop, and slung from the arm, or from the waist. Sometimes these satchels were made longer than was required for a book only, or of a scabbard shape, when they were folded round the arm, or tied to it by a knot. They were also embroidered and enriched with pearls and precious stones. The practice of carrying *les livres d'heures* in suspended receptacles ceased at the end of the fifteenth century. After that date, a page carried the required book to church. In the seventeenth century gentlefolks began to carry their books in their hands, or in their pockets. These *livres d'heures* were considered indispensable as an accessory to the toilet of ladies of good families in the fourteenth century. They are mentioned as necessary expenses by the poet Eustache Deschamps, in *Le Miroir de Mariage*. Another kind of bag, called an *escarcelle*, was reserved for messengers and pilgrims. This was furnished with a knife or dagger in a scabbard, which was slipped through a strap or slit made to receive it. A large *escarcelle*, without a knife, called a *gibecière*, was carried by travellers, whether nobles or peasants, suspended by their sides. These were as richly decorated as the rest, occasionally. One is thus entered in the inventory of Charles V.:—"*Une gibecière à perles sur champ vermeil à treffles, à troys fleur de lys.*" After our eyes have feasted upon the charming illustrations of other objects of the toilette, upon fragments of the alb and chasuble of Thomas à Becket, a sample of the stuff found in the tomb of Charlemagne, and a dozen other specimens of the "precious stuffs" made of silk and gold in old times, given in chromolithographs, we come to the close of the third volume, having only arrived, alphabetically, at the letter H.

The fourth volume, accordingly, proceeds with the *jarretière*, with the devices and mottoes embroidered upon it, including that upon the garter of the order created by our Edward III.,—*Honi soit qui mal y pense*. The fine gentlemen of the reigns of Charles VI. and Charles VII. wore, embroidered upon their garters, a device or cipher of some lady intermingled with pearls and jewels. M. Le Duc shows that whether trunk-hose or short-stockings were worn, these articles were used from a very early time. They are shown as worn in the Bayeux tapestry. Passing on to *joyaux*, we have a careful account of the treatment of jewels.

The populations of Gaul, he says, have always manifested a pronounced taste for ornaments in gold and silver, and for gaudy colours. The invasions of the barbarians from the north-east, instead of stifling this love of jewels in the West, served, on the contrary, to develope it, and under the Merovingians, civil vestments, and military vestments and arms, were ornamented with golden *bijoux*, which, although barbarian in point of fabrication, were not less of a great intrinsic value. Under the Carlovingians, the frequent intercourse of the West with Byzance spread over Italy and Gaul numbers of *bijoux*, the fabrication of which, together with those made in the West, acquired a degree of remarkable perfection. With the thirteenth century came reaction; though whence this came, or wherefore, it is difficult to explain; but, as in thirteenth-century architecture, simplicity, sobriety, if not austerity, became the order of the day. Only the high clergy continued to wear jewels on their vestments. St. Louis did not encourage the gentlemen of his court to appear in jewels likely to excite the covetous; and he affected the greatest simplicity in his own raiment. But in the fourteenth century, notwithstanding sumptuary edicts, the nobility returned to their passion for jewelry, and, under Charles V. and Charles VI., indulged their luxurious taste to a scandalous extent. The misfortunes of the commencement of the fifteenth century repressed the exaggerations of the fashion for a time; but this form of luxury reigned brilliantly again under Charles VII., Louis XI., Charles VIII., and Louis XII. "Precious stuffs" were, in very ancient times, produced in the East, and the crusades and the traffic of the Venetians ultimately caused their production in the West. These rich materials were literally precious, being gold and silk tissues with pearls and precious stones interwoven with them. There are several specimens extant of these tissues mingled with pearls of Oriental fabrication, which date from the eleventh and twelfth centuries; and the monuments of this period also tell of their extensive use by the French nobility. Borderings with pearls, clasps of large dimensions and of extreme richness, buckles, cinctures, coronets, earrings, and *cassolettes*, were further vehicles of rich ornamentation, all of which partook of an Oriental character until the middle of the twelfth century. After this time the imitation of Eastern art ceased, and a Western character was given to fabrics and *bijoux*, which was not displaced till the Renaissance. Venice continued to produce jewelled work through all this time, and in the sixteenth century, when Nuremburg *bijoux* were in vogue in France as in England and Germany, the Venetians made numbers of brooches, pendants, ear-rings, *châtelaines*, cinctures, in the new "tudesque" taste, thus realising great riches by their power of adapting themselves to fluctuations of fashion. Their talent for assimilation, and perfection of execution, quite excuses, in M. Le Duc's eyes, the drawback of counterfeiting. Their power of imitation, he adds, has been inherited by the Venetians of the present day; for, just as amateurs of antiquities can always find plenty to purchase at Rome and Naples, so in Venice, collectors of ancient jewelry can be suited with Nuremburg *bijoux* of equal beauty to those made in the days of yore, and at a much less cost.

Some of the modes of using jewels once in vogue are no longer employed. Before the change that occurred in the latter part of the twelfth century, pendants were worn to circlets and coronets that hung down upon the hair and descended to the shoulders. Under the reign of King Jean, gentlemen began to carry jewels of great value upon their vestments. They wore jewelled belts upon their hips which were worth fabulous prices. About the commencement of the reign of Charles V., they lowered these jewelled cinctures till they were even with the edge of their upper garment, or *cotte-hardie*, to which they were attached by *agrafes*. Their richly-embroidered capes with hoods to them were made to open upon the right shoulder, where they were fastened with jewels, much in the same manner as that with which the old Merovingian chiefs clasped their cloaks, only with a different form of ornament. They wore enormous collars of jewels, thick and cumbrous chains, and the coiffures of nobles, as well as dames, were covered with bijoux. Noble dames also wore pectoral ornaments descending from their throats almost to their knees. When the passion and fashion for jewels was at its height, many of the most ancient shrines which were rich in antique cameos and intaglios were stripped. Abbots and bishops bought the good graces of the neighbouring seigneurs with these acceptable presents. So many and minute were the fluctuations in taste, however, that we must not attempt to follow M. Le Duc through his ample survey of them on this occasion.

We will turn over the pages describing and illustrating the numerous articles of raiment, till we come to the mantle. This is a garment that held a high place among vestments in the Middle Ages. It belonged particularly to the nobility, and under the Merovingians was only worn by the dominant race. It must not be confounded with the cape, *gone*, or *tabar*, which were worn by all classes. The mantle, and the manner in which it was worn, was a mark of nobility which was not effaced till the end of the fourteenth century. The Greek manuscripts show square and semicircular mantles, both fastened on the right shoulder, as worn by the Eastern emperors and great persons of both sexes. The square form appears to have been worn on ceremonial occasions by the Merovingian and Carlovingian kings in imitation of the Eastern emperors; but an ancient mosaic of *Sainte-Suzanne*, in Rome, shows Charlemagne habited in a short tunic with a semicircular blue mantle, fastened upon the right shoulder, and covered by a sort of *pèlerine*. The semicircular form is also seen upon the shoulders of kings and queens in the western *portail* of Chartres Cathedral, and upon those of Notre Dame de Châlons-sur-Marne (1140). These early mantles were excessively rich, covered with embroidery and pearls, and bordered with jewels, and down the left side near the slope made for the neck was a parallelogram of a still richer material. Illustrations of many of them are given, both spread out, that we may see the exact figure of them, and falling from the portly and knightly shoulders of princes and nobles. One of Charlemagne's nobles leads this superb procession of mantles. He is followed by a personage wearing a circular mantle, not semicircular, which is fastened on his breast. This

figure is taken from a tenth-century manuscript. Then we have early statues from Toulouse and St. Denis, and more figures from manuscript, till we have counted twenty-one personages all wearing this noble article of dress in various ways. The mantle of one "grande dame" is lined with ermine, and prevented from trailing upon the ground by a female attendant, who walks behind her mistress holding it up. Masks; *mélotes* (sheepskin capes worn by the peasantry); mirrors to sling from the cincture or carry in the pocket; mitres (illustrated in gold and colours); pocket-handkerchiefs; mufflers; knots (worn to indicate vows), including that worn by the chevaliers of the order of *Saint-Esprit au droit Désir*, or *du Nœud*, which was composed of a loop of gold and another of pearls; gold embroidery, called *orfrois*, when made in [belts or bands to be used as borders, of which upwards of twenty ancient examples are shown, follow each other in rapid succession, and conclude the *premier fascicule* of the fourth volume.

We are reminded early in the next portion of the work that pattens, *patins*, formed one of the items invented in the Middle Ages, to meet the wintry difficulty of the bad state of the roads. They were worn by gentlemen in the fourteenth and fifteenth centuries below their pointed boots. It seems it was always considered bad manners to make a noise with them upon the flagstones in walking; and Martial d'Auvergne, in his "Arrêts d'Amour," interdicts a lover from clattering his pattens when he walks in the church to find his mistress. They were formed of wooden soles, more or less thick, kept in their place by two sandals crossed upon the instep. M. Le Duc has, we note, as much to tell of the peliçon, or pelisse, as of the mantle, and quite as many and various illustrations of it to show. But we must pass these, with perukes, perfumed, tinted, and covered with gold-dust though they be; toilet-cases, with all their Mediæval toilet secrets; plumes; *poulaines*, or pointed shoes; *pourpoints*, or jackets; rochets, or starting-point of the blouse; the sachets, or little bags hung round the neck in which people carried scent or relics about with them; *scapulaires*; seals, sceptres, and other interesting items, including a long and scrutinising treatise, or *résumé*, on robes, to leave space for a brief indication of the contents of the part that is issued of the fifth volume.

We should not look with antiquarian interest only upon the arms and defences in use in the Middle Ages, urges M. Le Duc, because they are the result of the contrivances always in course of consideration to meet the requirements of war, by people who were not sitting safely in comfortable offices, discussing the question; but were actually always in the field, or in the lists, or in strongholds they were bound to defend. We saw in the Sebastopol days how the troops altered their equipments to suit their altered circumstances with a swift ingenuity, and we should remember that this process of adaptation was formerly always going on. After a few further prefatory remarks, redolent of Crécy, Poitiers, and Agincourt, the alphabetical arrangement commences with the *aiguillette*, which is shown as worn in different modes on three knights. These are the leathern laces tipped with metal required to fasten one part of a warrior's costume to another, or to the place it was to protect. The *ailette* was a piece of armour worn on the shoulder generally in France, but very rarely in England. Many a blow or cut aimed at a head fell upon the shoulder instead, and this was a contrivance tied on with *aiguilettes* to meet that slip of the lance or axe. It was sometimes painted with the arms of the wearer. There are seven illustrations of this piece of armour taken from MSS. entitled "Tristan," "li Roumans d'Alixandre," "Godefroy de Bouillon," "Lancelot du Lac," "Histoire du Roi Artus," now in the French national library, whereof six are of a square form, and one circular; and we are referred to other examples on statues in Bâle Cathedral, the Church of St. Denis de Coulommiers, and Lyons Cathedral. Crossbows are next minutely described and delineated. Bows, with snatches of the *Roman du Rou*, telling of the battle of Hastings; and figures from the Bayeux tapestry, to illustrate them, follow. Armets, which is a term corrupted from "hiaumet," or "helmet," are described very fully, as is the subject of armour generally from the days of Charlemagne down to the sixteenth century. Such is the power of tradition, M. Le Duc observes, that, despite the change produced by the use of artillery, it was long before gentlemen believed in war carried on without this accoutrement; and to this day, he asks, have not most of the European armies retained their cuirassiers, notwithstanding that their cuirasses are not proof against conical balls? Sixty-two full-length figures illustrate the word *armure*. Returning to details, *arrière-bras* and *avant-bras*, arm-guards, present themselves as next in succession. It will be remembered that among recent pre-historic finds have been noticed arm-guards pierced with four holes to admit of them being fastened on. We are not taken back so far as this by M. Le Duc, who mentions the second half of the thirteenth century as the date of this invention. In the first place the warriors of that date thought of the ailette to guard their shoulders; then *les cubitières coniques* for their elbows; then a back-guard for the arm; and lastly a fore-arm guard. The *brassard*, or articulated piece held together by rivets, was a further development of the same idea. Only foot soldiers wore the separate pieces, whereas the *brassard* was adopted by any armed men regularly equipped. With the *bacinet* this first instalment of the fifth volume closes; and the companionship of the French knights, who were so much to our Plantagenets, ceases for the present. M. Le Duc is making a memorable addition to French literature.

THE NEW "WELLINGTON MILLS," IN LAMBETH.

AN extensive block of buildings, to which the above name has been given, is in course of erection in Westminster-road, Lambeth, and within the last few days the structure has been externally completed. The new building, which has been erected as a factory for Messrs. Oakey & Sons, emery and blacklead manufacturers, is a striking object amongst the surrounding buildings. It is situated at the angle of Westminster and Kennington roads, immediately adjoining the site upon which the new Surrey Chapel, for the Rev. Newman Hall, is about to be built. The principal elevation is in the Westminster-road, but the block may be said to have four frontages, namely, the main elevation in Westminster-road, another at the angle of the last-named road and the Kennington-road, and a third frontage to Kennington-road, whilst the rear of the building faces Mead's-row, and extends the entire length of that thoroughfare from Kennington-road to Westminster-road.

The position of the site has necessitated the building being somewhat irregularly shaped; but notwithstanding the difficulties with which the architects have had to contend in this respect, the different elevations are more or less effective. The extreme length of the structure is about 320 ft. by 160 ft. in width, the entire premises covering an area of upwards of an acre in extent. The main frontage in Westminster-road, which contains the warehouse portion of the building, is 90 ft. long by 50 ft. in depth, and is very lofty, being 70 ft. in height from the street-level. In addition to a deep and spacious basement, it contains the ground-floor and three stories above. The elevation of this part of the building, to the top of the ground-floor windows, is of Portland stone, and there is a portico in the centre as the principal entrance. The facings of the upper portions of the elevation are of yellow patent brick, with Portland stone dressings, and carved trusses, between which are festoons, surmounted by a massive cornice in terra-cotta. This portion of the building contains a residence for the superintendent of the premises.

The frontages at the angle of Kennington and Westminster roads, as well as those in Kennington-road and Mead's-row, are not so lofty as that already described. These parts of the structure will in part be devoted to the manufacturing purposes of the establishment, the ground-floor being used as packing-rooms, and also for stores. These last-named elevations have a distinctive and novel appearance, not only in point of construction, but as regards the materials used. They consist mainly of spacious windows from the ground-level to the cornice of the building, divided by piers, and at the heads and sills of the windows; the entire length of the several frontages is faced with hexagonal tubes, formed of a combination of concrete and granite, on the system of Messrs. Parr & Strong, of College-hill, in the City, the architects of the building: and which we have before now illustrated.

The several elevations and sides of the building thus described, inclose a spacious area within them. In the centre of this area, with a roadway entirely round it for the receipt and delivery of goods, a separate and distinct building, one story in height, has also been erected, for the machinery and steam-power required in the manufacturing business of the establishment. In connexion with this part of the building is a lofty chimney-shaft, which is a striking feature in the structure. The chimney, which is octagonal in form, is 12 ft. in diameter at the base, and is carried to a height of 100 ft. It is chiefly of yellow brick, uniform with the rest of the building, ornamented with red, white, and blue brick bands, and diamond work of the same material, with a cast-iron cap and ornamental brass foliage at the top, between 7 ft. and 8 ft. in depth. The water required for the works will be obtained from an artesian well, which has been sunk on the premises.

The whole of the works have been carried out by Messrs. Oakey & Sons themselves, under the immediate superintendence of Messrs. Parr & Strong, the architects, Mr. Eastman acting as clerk of works. Independently of the value of the land, the building will involve an outlay estimated at from 12,000*l.* to 15,000*l.*

THE NEW EXTENSION WORKS AT THE BLACKFRIARS GOODS STATION.

THE heavy works which have for some time been in progress at the Blackfriars station of the London, Chatham, and Dover Railway Company, in connexion with the enlargement of their goods area, are now considerably advanced towards completion. The new warehouses which the Chatham and Dover Company are erecting, but which will be rented and chiefly used by the Midland and Great Northern Companies, have been carried up to their intended height, and will be covered in within the next month. These warehouses are spacious and substantial, the main walls being 3 ft. in thickness, and the several floors from the basement to the uppermost stories are carried on iron pillars. Messrs. Hill, Keddell, & Waldram are the contractors for this portion of the works, and the amount of the contract for the warehouses alone is upwards of 40,000*l.*

In addition to the warehouses, which are being erected in Southwark-street, some distance to the eastward of the present station, the intervening space between the last-named and the warehouses is being added to the existing railway level, and connected with the upper portion of the warehouses. The area of this added merchandise space and sidings, irrespective of that furnished by the warehouses, is between one and two acres. This increased area is about 600 ft. in length, from its commencement, by a junction with the main line near Southwark-street to the margin of the river, and upwards of 50 ft. in width. Immediately to the eastward of the present boundary-wall of the station, the widened line is being carried forward partly on arches, and partly by a girder bridge over Holland-street, and the space, again eastward, between these arches and the warehouses, is being connected with the latter by thirty-four massive iron girders, thrown across, one end resting on the newly-formed arches already referred to, and the other end embedded in the wall of the warehouses, 25 ft. above their ground level. On the extended space thus obtained, four additional sets of rails and sidings for merchandise purposes will be laid, and the railway wagons will be raised and lowered to and from the railway level into the ground floor, and the several other floors of the warehouses by hydraulic power. The contractors for these works are Messrs. Ball & Gammon.

Simultaneously with the extension works at the station for increased accommodation for the goods traffic, the company are also about to effect an important improvement in reference to passenger traffic. At present, although there are four lines of rails between Ludgate Station and Blackfriars over the company's viaduct, there are only three lines from the entrance into the Blackfriars station, to a point near the Borough-road station, the result being that both the incoming and outgoing trains are constantly impeded and delayed between the two stations. A fourth line is about to be laid down through the Blackfriars station to the point named, near the Borough-road, which will complete two distinct sets of rails, and obviate the constant stoppages of the trains which are now necessary.

COLOURED DECORATION.*

IN asking you to discuss the question of "Coloured Decoration," I must request you to pardon me if I appear to detain you unnecessarily with a recital of those natural laws on which its successful practice must ever be founded. We have to deal with a subject which is not dependent on individual taste alone, but which, like every other branch of professional practice, is governed by inflexible rules. It is true that these laws may be unconsciously recognised, and their teachings followed,—as in the other departments,—without a clear apprehension of the matter; still, I submit that much will be gained if we start with a common groundwork for discussion.

We must all desire to see the architect the real director of his works. We are every day urging that not only the building itself, but its decoration and furnishing, should be confided to his care. We are constantly protesting against a work which has been carefully planned and rendered externally pleasing, being spoiled internally when its completion is confided to other hands, and this from want of accordance, even although the decoration may be intrinsically good. The sculptor and carver willingly come to the architect's aid, and he is often wisely content to direct and define, generally leaving minor details to their taste and skill. The painter,—beset as he has been by chemical and mechanical difficulties,—offers his best services. Why should not the decorator and upholsterer also act more frequently with the architect in giving unity to his work; and this not only in great undertakings, where the necessity for unity is acknowledged, but in smaller and apparently unimportant commissions? A client, too, will be more willing to listen to the suggestions of his architect, when he finds that they are based on the theory that good taste is not dependent on cost, and that successful decoration and furnishing do not necessarily mean a large additional expenditure.

I have said that successful decoration in colour must be based on the right apprehension of what appear to be inflexible natural laws. Let us see how these laws are ordinarily defined, and then proceed to apply them to the subject in hand:—A beam of light falling on a glass prism in a darkened room is found to be split up into seven coloured rays (or rather bundles of rays), which arrange themselves in the following order,—red, orange, yellow, green, blue, indigo, violet. This is further confirmed by the same prism held before the electric lamp, and (more faintly) by the colours in the rainbow. We also learn that these seven colours are capable of being reduced to three,—red, yellow, blue,—which we designate primary colours, as we have failed to reduce them further. I am aware that much discussion has lately been caused by an effort to class green as one of the primaries; but I prefer, for many reasons, to follow the accepted arrangement.

I need scarcely remind you that red and yellow produce orange; blue and yellow, green; and red and blue, violet (or purple). These, then, are termed secondary or composite colours; and, with the primaries and the addition of the colour indigo forming the solar spectrum, you perceive they arrange themselves between the colours through whose combination they arise. All further derived colours (tertiary) may be regarded as coloured greys, as more or less broken colours in which a primary or secondary predominates. Still further we are taught that, as yellow and blue produce the colour green, that colour is to be spoken of as the complement of red; the red and the two forming green completing the primary trio, and so with blue and orange and with yellow and violet. These colours, as I have just quoted them, also form our first harmonies, as complete harmony depends on the presence of the three primaries in a composition. On the foregoing simple statement the whole science of colour rests. I have placed on the wall a few diagrams which will make this still clearer, and which are also meant to illustrate the deductions which I now propose to draw.

If we place red and green side by side, we perceive that they mutually purify each other: this is the result of the law of contrast. It is so with black and white, and with the coloured complementaries, when so placed. If we look upon a bright red wafer for some time, we perceive that the white paper on which it lies seems to be faintly tinted, where it touches the wafer with the complementary green. If, after gazing on it, we remove the wafer, we find the space it occupied appears to be also tinted with the complementary green. Similar effects will, of course, be observed, if we use wafers the colour of the other primaries. We accept it then as an axiom that the primaries have a tendency to produce in their surroundings a tint complementary to themselves—red inducing, even in black, a greenish tint.

Again, it is found (as was to be expected) that colours mutually react on each other. Taking, even, my first example red and green, should the red have a decided orange tinge, the green will look bluer; should the green be bluish, the red will appear orange-tinted; orange, the complementary of blue, will appear to have been added to it. Take a different example: if I have several pieces of scarlet cloth, and look at them in succession, although they be of exactly the same colour, cut from the same piece, they will seem after a time to have lost brilliancy; the fatigued eye has developed the complementary green, and the scarlet has been tarnished, all mixtures of the primaries being broken, dulled, or tarnished colours,—we look for some on a green colour, and find the scarlet has been restored. It is an intuitive appreciation of these laws which causes the blonde to select blue and green to enhance hair or complexion, and the brunette to prefer red or orange tints. You will perceive at once how a red head-dress will bronze the negro, or an orange enhance the natural blue-black of some races. These considerations will also suggest to you how all colours will gain in purity and distinctness by being separated by black or white, as thereby we neutralise this tendency to tarnish. The colours of the spectrum may be deepened or dulled by black, or lightened by the addition of white, or they may be altered by admixture with each other in varying proportions; thus we get tones and hues—terms often confounded. The tertiary colours illustrate this; they are olive, russet, and citrine:—

Olive...	{ Blue + Yellow = Green Blue + Red = Purple... }	Blue preponderates.
Russet	{ Blue + Red = Purple... Red and Yellow = Orange }	Red preponderates.
Citrine	{ Red + Yellow = Orange Blue + Yellow = Green }	Yellow preponderates.

As the pigments which we use are never pure, each primary colour being more or less tinged by its fellow primary, and so with the rest, no combination of them will return to white, or the absence of colour, as in the case of the colours of the spectrum obtained from the solar beam, or by the electric lamp. In theory, the colours red, yellow, blue, should produce white, if combined in the proportion—yellow, 3; red, 5; blue, 8; but painted on a disc and caused to revolve rapidly, the grey produced is tinted most frequently by the red and blue, and the resultant colour is generally a violet grey. Indeed, as I have said, all combinations of the primaries produced by pigments are dulled and broken, as you must have often perceived when red has accidentally been present in the mixing of green, and the tendency is towards black rather than white. The tertiary colours, then, as they contain the three primaries, consist of greys produced by this admixture, coloured by the primary in excess; and these can, of course, be further combined so as to be distinctly dominated by a secondary. It is owing to this difficulty of admixture, and to save time in preparation, that the palette of the artist is being constantly added to by new pigments ready to his hand.

I would ask your attention to another peculiarity of the primaries and their combinations. The yellow is the most brilliant and obtruding colour; the red warm, and occupies a middle place; the blue cold and receding: hence the yellow is suited for projecting surfaces, the red for hollows and middle distances, and the blue for the mass. In the figures I have quoted, you perceive the blue has an area equal to the two others combined. You see the effect of this brilliancy of yellow in the secondary orange, and its tinge in scarlet; the warm of red in purple, and its tinge towards blue in crimson; the coldness of blue in some greens; and the brilliancy of yellow in the new aniline colour, where we have the luminous leaning towards yellow. In preparing colours it is, therefore, desirable that pigments to be combined should lean towards each other;—in orange, for instance, that red should tend towards orange, and the yellow should be free from a greenish tint; in green, that the blue should be greenish rather than purple; and so on; the tendency to broken or impure colour being favoured by traces of the absent primary in the pigment as already stated.

I said that colours were purified by being separated from each other by white or black. Let us see the effect of a ground of white or black on the colours. The general tendency of white will be to exalt colours by contrast of tone; of black, to lower them, for the same reason: and yet there are changes respecting individual colours worth noticing. Yellow, for instance, will appear much lighter with black than white, in the former case having acquired a greenish tinge; light blue will contrast most favourably with white, as will light green; red will be subdued by black by contrast of tone; while violet, for the same reason, will be improved. Contrasts of this kind are well seen in some of the national flags,—the red, white, and blue of France; the red, gold, and black of United Germany; the white and green of Saxony. Perhaps grey harmonises best with the majority of colours, and, if slightly tinted with the complementary of the colour, has a most pleasing effect: indeed, by the law of simultaneous contrast, this will occur in many cases without the actual addition of the tint. It is further to be noticed that the substitution of gold for yellow in decoration produces a marked change. Gold with black is lowered, whitened by contrast of tone; while with blue it is reddened, enriched by the development of the complementary orange. I shall have occasion to pursue this further in speaking of room-decoration.

Let me now say something on the subject of modes of decoration generally as applied to architectural works, and on the application of these laws which I have hastily sketched,—first, as to public buildings, and then as to private dwellings. We have to travel over a large field, and within the limits of a single paper our review must be a cursory one. The grandest modes of coloured decoration are—mosaics, frescoes, stained glass, paintings proper, marble inlays; in private dwellings, colour prevails in painting, hangings, carpets, upholstered furniture. The buildings most susceptible of decoration, of the costly class, are—churches, picture-galleries and museums, theatres and public halls, palaces and the residences of the wealthy.

There can be no question that mosaic decoration is the most durable and suitable for works on the large scale, combined with coloured marble in great masses: as at Venice and Rome, it leaves nothing to be desired. St. Mark's, at Venice, which may be regarded as a museum of this class of decoration, is admittedly unrivalled. In recent times, through the efforts of Dr. Salviati and others, the ancient schools of mosaicists have been revived; and it is even possible to transport the finished work, and place it on the wall in the most distant places. We have a specimen of Dr. Salviati's work in this room, and at the Houses of Parliament, the Wolsey Chapel at Windsor, at St. Paul's, and the Prince Consort Memorial in Hyde Park, as well as in the artist portraits at South Kensington Museum, we have admirable instances of its revival. In the case of the portraits in the niches of South Kensington you have also an opportunity of comparing the mosaic picture with the original drawing. The great merits of this mode of decoration are: the enamels employed are practically indestructible as regards material and colour, the only possible weak point being the attachment of the component tesseræ to their places in the composition. They are capable of the finest or coarsest mode of production, are suited for all points of view, and, by the addition of gold and silver, at what may be regarded as nominal cost, they can be of a richness with which no other decoration can compete. Recently the number of colours capable of being used has been largely increased. It has been objected that they are not capable of as flexible treatment as the various forms of fresco; that their peculiar glitter is unfavourable to distinct view; and that they are costly, and require to be surrounded by accessories as rich as themselves.

Now it must be remembered (taking the last objection first) that all decoration, carved or coloured, is open to this. I admit, when we decorate at all, it is hard to keep the balance—to know where to stop. Witness the panelling and panelled vaulting of the Perpendicular period: this unrest in art-work which has made the Sainte Chapelle a blaze of colour, and will

* By Mr. C. H. Brien. Read at meeting of Architectural Association of Ireland, February 27, 1873.

leave no blank spaces externally or internally in Westminster or (internally) in the restored crypt of St. Stephen. A difficult problem is about to be solved in the proposed completion of St. Paul's. But the principle of decoration in mosaic does not necessitate gorgeousness. The band surrounding the Albert Hall is in principle a mosaic. Its most effective works can be done by inferior hands; whereas, in fresco, the preparer of the original drawing must also do the completed painting, if great excellence is to be reached. Its durability—as I have more than once said, its natural accordance with marble and stone, as terra-cotta ornament with brick—must make us all long for its extension, and hail every effort to place it more within our reach. I do not think its glitter is a disadvantage, as it is peculiarly suited to dimly-lighted positions; on carved surfaces this gives the colour a peculiar charm; and a system of concentration of ornament is equally necessary in stained glass and frescoes. Except in the cases of practically unlimited expenditure I have named, this objection need not have place. Generally, it may be stated the figure-subjects in mosaic are best placed above the line of vision; that the subjects should be simply treated, the scale large. I think the objection that Dr. Salviati's mosaic of the "Last Supper" at Westminster is to too small a scale, has considerable force. There is much in common between mosaics and painted glass in these respects.

FEMALE ART.

"*Society of Lady Artists.*"—The ladies have brought together, in the Conduit-street Gallery, 469 works of art,—drawings, paintings, and copies,—which form an interesting collection above the average in merit of those of the last two or three years. Mrs. Marrable, Miss Marian Croft, Mrs. Backhouse, Miss Thornycroft, Miss Partridge, Miss S. S. Warren, Miss Eva M. Ward, Miss Lane, Mrs. Rayner, Miss M. Rayner, Mrs. W. J. Brown, Mrs. Brownlow King, Miss Elizabeth Thompson, Madame Bischop, and Miss Georgiana Swift, have most distinguished themselves.

The Duke and Duchess of Teck visited the collection before it was opened, and a number of the pictures have been purchased.

Female School of Art.—Her Royal Highness the Princess of Wales has consented to preside at the distribution of medals gained by the students of the Female School of Arts, Queen-square, Bloomsbury, on Wednesday, the 26th inst., in the theatre of the University of London, Burlington-gardens.

A Statuette.—We are glad to hear that the Council of the Art Union of London determined at their last meeting (Lord Houghton in the chair) to produce in bronze a revised version of the statuette of Cimabue, for which the National Medal was awarded last year to Miss Emily Selous (now Mrs. Fennessy), in connexion with the Female School of Art.

THE BUILDING TRADE IN LONDON.

WE are threatened with another disastrous strike and all its evils and losses. The masons have given notice to the masters that they require 9d. an hour instead of 8½d. as at present, on the ground that the purchasing power of money is less than it was; and the masters, after much consideration, have declined to concede it, but have informed the applicants that they are perfectly willing the men should make longer time at the present prices, during the summer months, and so earn more money. The masters consider, as we understand, that the limit has been reached, and that further increase in prices would have the effect of checking work. It remains to be seen what determination the men will arrive at. What is to be the end of the constant move onward in the rate of wages and the consequent rise of prices, we are unable to divine. "With pig-iron at 9*l.* 10s. a ton," a well-known builder said in our hearing yesterday, "and timber *twenty-five per cent.* higher than I have ever known it, even with the duty on, how am I to make my bills satisfactory to employers?" How far may the patience of the public be trusted? If there were no other country than England the general rise in prices would be of less consequence, excepting to annuitants and other thousands with fixed incomes heretofore equal to their maintenance; but this is not the case, and it may be feared that many branches of manufacture will leave the country. One fact is worth a dozen suppositions. The inventor of what is known as the Universal Tooth and Nail Brush Rack, a useful little article for the wash-stand, had arranged for their manufacture in white wood at 3s. 6d. a dozen, and the makers supplied him and were well satisfied. The union men interfered, and said the racks must not be made for less than 4s. 6d. a dozen. The inventor found this would stop the sale, sent to Nuremburg, and now receives all he wants from that city at 2s. 6d. a dozen. We mention this little story, the truth of which is vouched for to us, as serving to show what is going on in much larger ways all over the country. This is surely matter for serious reflection, and should "give us pause." What seems best for us individually at the moment is not always so in the long run.

TRADES MOVEMENT.

Manchester. — A general meeting of the members of the Operative Society of House Painters in connexion with the Manchester Alliance, has been held to consider the desirability of requesting an advance on the present rate of wages received from local master painters. After some discussion a resolution was unanimously passed to the effect that a notice should be forwarded to the employers respectfully requesting an advance of ½d. per hour on all classes of work. It was stated at the meeting that several of the employers in the town had already conceded the advance.

Glasgow.—The house joiners have laid before their employers a request for a rise of wages from 7d. to 7½d. per hour. The employers have declined to accede to the request, and the men are to consider whether or not they shall resort to a strike, with the view, if possible, of enforcing the desired rise.

Edinburgh.—At a meeting of the joiners on strike, it has been resolved, after a somewhat stormy discussion, to accept the terms offered by the masters, viz., 7d. per hour, being an advance of ½d. on former wages. A number of the men who had struck work, of whom there were about 300 in all, accordingly applied for employment on the masters' terms, but, so far as we have learned, about the half of them only have been successful in their applications. Some of the men left town in order to seek work elsewhere, a number of the vacancies having been filled up during the 24 hours' strike. The strike committee, however, have denied the correctness of this statement. In Leith a similar result is thought not improbable, as the number of men on strike does not now, we are told, exceed 30, out of about 160, which is the total number of hands in Leith.

Greenock.—The master joiners having acceded to the demand of the men for an increase of wages, the new arrangement has come into force. The increase was ½d. per hour, the wages being now 7d. per hour.

THE PROPOSED BUILDING ON THE THAMES EMBANKMENT.

THE St. James's vestry, Westminster, have had under their consideration the proposals of the Government to build upon that part of the Thames Embankment near Charing Cross, which is to be retained by the Government under the arrangement into which they have just entered with the Metropolitan Board of Works for the land west of Charing Cross, which has been so long in dispute.

At the meeting of the vestry, Mr. Bradshaw brought forward a motion to the effect that it was undesirable to appropriate any portion of the space reclaimed from the river to building purposes, on the ground that the buildings would destroy the beauty and convenience of the great avenue which the embankment roadway affords through London, and, by covering a space hitherto unenclosed, would impair the healthiness and convenience of the district. He urged that the space on the foreshore to be retained by the Crown should be devoted to the same purposes as the rest of the space,—public recreation and amusement; and he hoped that the Metropolitan Board of Works would not consent to any Government proposals which would have the effect of advancing the line of buildings beyond the line of houses in Whitehall-gardens.

The discussion which followed showed that there was a considerable difference of opinion on the subject amongst the members of the vestry present, several of whom appeared to think that the proposal of the Government to build on the spot in question would be an advantage rather than otherwise; Mr. Bidgood, one of the members, remarking that the proposed new buildings would shut out from sight the hideous railway shed of the South-Eastern Railway Company.

The result of the discussion was that the vestry refused to take action in support of Mr. Bradshaw's suggestions, thereby practically expressing their approval of the proposal of the Government to build upon this portion of the land.

THE ASYLUM FOR IMBECILES, AT CATERHAM.

EXTENSIVE additions are now being made to the Metropolitan Asylum for Imbeciles at Caterham. The committee accepted the tender of Messrs. Henshaw for the new recreation-hall and additional block, and the works are being rapidly proceeded with.

The recreation-hall is about 120 ft. by 45 ft. (including stage), and about 22 ft. high, divided on plan into nave and aisles by iron columns supporting brick arches. Above the nave is a dormitory for male patients, with all necessary lavatories, &c.

The necessity for this hall was strongly urged by the Commissioners in Lunacy at their last visit, and at Leaveaden Asylum a ward has been set apart for the purpose of recreation, but no hall has yet been erected in the position originally fixed by the architects, and shown on the plan illustrated in the *Builder* some years ago.

In addition to the hall mentioned, the Caterham committee are erecting an additional block for 160 female patients, which will when completed bring up their entire accommodation to nearly 2,000 patients.

The architects of these additions are Messrs. John Giles & Gough, who were also the architects of the original structures.

STATE OF VICTORIA PARK CEMETERY.

ON more than one occasion we have described the unsanitary state of Victoria Park Cemetery, and objected to the course pursued there. A writer in the *Evening Standard*, after quoting some passages from our columns, adds:—"Is there any necessity for carrying the indictment farther. If there be, I can confirm and supplement the above by other facts. The last coffins placed in graves ought to be 7 ft., or at least 5 ft., below the surface of the soil. I have been witness of interments in reopened (old) graves where the coffins were scarcely an arm's length from the surface of the soil. The staff of grave-diggers in this cemetery is barely sufficient to open and close the newly-made graves; so order and neatness, or even decency, are not dreamt of. The owners or directory of this cemetery feel the exigencies of their position so much that they have begun actually to manufacture space. An offset of the graveyard, which existed for years as a sand-pit, is now being filled in, to be utilised for interments as soon as the small patch immediately within the gates is used up. Siderally the graves are advanced nearly to the gates, and the central carriage-way, which only extends for a short distance, will be eaten up if an ukase does not go forth from the Secretary of State. I think I have now made out a case for inquiry, but if instituted it must be an exhaustive one, into the past history, management, and surroundings of the Victoria Park Cemetery."

SCHOOL BOARDS.

London.—Mr. Reed, M.P., brought up a report from the works committee, stating that the following tenders had been received for the erection of a school in Lower Wandsworth-road, for 1,078 children, viz.:—J. W. Falkner, 8,250*l.*; Marsland & Sons, 8,150*l.*; James Cooper, 8,147*l.*; Gammon & Sons, 7,596*l.*; B. E. Nightingale, 7,595*l.*; Nixon & Son, 7,589*l.*; Newman & Mann, 7,578*l.*; J. Cook, 7,565*l.*; and W. Higgs, 7,549*l.* The tender of Mr. W. Higgs, of Crown Works, South Lambeth-road, S.E., was accepted. The area of the site is 23,000 square feet. The cost was 2,500*l.* The schools have been designed by the Board's architect, and will cost 7*l.* per head. The Board has also resolved "That the

amended tender of Messrs. L. H. & R. Roberts, of 34, Rheidol-terrace, Islington, N., amounting to 6,861*l.*, for the erection of the schools to be built upon the site in Harper-street, New Kent-road, in accordance with the revised plans, be accepted; and that the tender of Mr. W. Wigmore, of Bradfield House, Fulham, amounting to 4,825*l.*, for the erect on of a school to provide accommodation for 818 children, on the site in Eagle-court, St. John's-lane, Clerkenwell, be accepted."

Leicester.—A letter was read from the Education Department, approving of the plans of the Oxford-street schools, and also recommending the Public Works Loan Commissioners to lend the requisite amount.

Halifax.—The clerk read the report of the sites and buildings committee, which stated that having examined the several set of plans and designs (numbering eight), for a school at Booth Town, received in competition, they gave the preference to that under the motto, "We live to learn," considering its arrangement of ground-plan to be the best, and they recommended the Board to accept it on condition that the architect would produce a revised elevation more in accordance with the views of the committee, and make such other alterations as may be suggested. The chairman observed that some of the other plans had various degrees of merit, still the committee did not find one which so perfectly came up to the idea of the Board, and therefore they could confidently submit it to the approbation of the Board. The ground-plan was the best of any in its arrangements; but the elevation was not quite approved. The report was unanimously carried, after which, the successful plan having been opened, the chairman stated that, with one exception, the committee were entirely ignorant of the quarter from which any of the plans came. The successful design was then stated to be by Messrs. Leeming & Leeming, architects, George-street, Westminster.

Northampton.—The Board have consulted Mr. T. Roger Smith upon the designs submitted to them in competition for two schools which they are about to erect.

METROPOLITAN CONVALESCENT INSTITUTION.

THE committee having purchased a site upon Kingston-hill, determined to erect a building for the reception of the children convalescents now provided for in two old-fashioned houses, situated at Mitcham and Hendon. Accordingly they invited four architects to send plans in competition for the proposed building, but upon reconsideration, as we are informed, they withdrew their invitation, and called upon Mr. H. Saxon Snell to prepare a design. The working drawings and estimates are being prepared, and tenders will be invited so soon as the legal transfer of the ground has been completed. The building will accommodate 200 children, and the estimated cost is about 17,000*l.*

ART AND SCIENCE.

A "FINE ARTS Financial Association" (rather an odd idea, it strikes us), is announced, with a capital of 150,000*l.*, in 30,000 shares of 5*l.* each, the principal object being to advance money to artists and others on works of art, and to effect the sale of such works on conditions mutually advantageous to the borrower and the company. The prospectus states that artists wishing to obtain advances upon their works do so at a considerable disadvantage, as they only get a nominal amount of the value at a large rate of interest, whilst the works are stored away, thus preventing their exhibition for sale. It is therefore believed that this company will supply an existing want of making advances to artists at 10 per cent. per annum, or such terms as may be agreed upon, the company finding a proper place for the exhibition of the works for sale, on which, when effected, a moderate commission will be charged, and the balance between the amounts obtained and the advance handed to the owner. Depositors may clear their deposits at any time, on paying the advance and interest, without any charge for exhibition. Works of art on which deposits are made, and which are not intended for sale, will not be exhibited, unless desired. Depositors may, upon special terms, have their deposits exhibited at any picture exhibition in the kingdom, and periodical sales will take place of uncleared deposits. The company will also buy and sell works of art, on its own account or on commission. The project is stated to have been favourably received by artists and others, and negotiations are already in progress for advances on valuable collections of high-class pictures.

Lectures on Greek Art.—The Darlington Church of England Institute have had Mr. T. H. Thomas, of London, engaged at the Central Hall, delivering a series of lectures on Greek Art. The attendances were not so large as the interest of the subject deserved. The lectures were illustrated.

Gloucester County Museum and Schools of Science and Art.—The formal inauguration of the building in Brunswick-road, Gloucester, recently erected for the accommodation of these combined institutions, will take place on Easter Tuesday, the 15th of April, according to the local *Chronicle*. Earl Ducie, lord-lieutenant of the county, has undertaken to preside at the ceremonial to be observed on the occasion.

ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon, March 1st, a visit was paid by about sixty of the members to "The Criterion," the building now being erected in Piccadilly for Messrs. Spiers & Pond. The roofs are nearly completed, and some portion of the interior finishings is in position. At the last ordinary meeting of the Association on the 7th inst., thanks were voted to Mr. Verity, the architect, for personally accompanying the members over this building. The thanks of the general body of the Association were also voted to Mr. T. Roger Smith for the course of lectures on "Professional Practice," recently brought to a close.

A paper was read by Mr. E. C. Robins, on "Middle-class Schools for Girls," calling attention to the general question of secondary education for girls, and the provision for it in different countries; noting also the views of the advocates for large schools, and such steps as have been taken to provide them. These advocates for boarding and day schools, each to contain a considerable number of children, consider that their propositions will now and hereafter be largely acted upon. Their requirements are now sufficiently definite for the work of the architect, in the provision of suitable buildings for the children of the middle classes,—not widely differing from those provided for the poorer classes, *e.g.*, the best schools for primary instruction of school Boards,—but with increase of comfort and of appliances for a somewhat wider range of study. We shall return to the subject.

ARCHITECTURAL ART IN ENGLAND.

ON the 6th inst., Professor Kerr lectured, at the rooms of the Society for the Encouragement of the Fine Arts, Conduit-street, on "Architectural Art in England"; Mr. James Edmeston in the chair.

In the course of his remarks, the lecturer said that the fine art of architecture was at the present moment the subject of extremely bitter controversy; and it was certainly remarkable that criticism, without which no art could flourish, should be, as regarded architecture, a dead letter. The main reason of this was owing to what was called the "battle of the styles,"—Gothic *versus* Classic,—the two causes being continually pleaded together. Architects have been told to ignore this controversy, and to turn their attention to their real duties; but in vain. The two styles of Gothic and Classic represented two different schools of thought; and all other styles were either subsidiary to these or were out of the category by reason of their being barbarous. We had been asked to invent a new style; but that was utterly impossible; for a style of architecture was a thing that could not be invented suddenly, or on demand: it could not be introduced into any country except by means of the development of ages. From the commencement of human history, temples were, and always would be, the great standard works of architecture. Amongst the Greeks and Egyptians this was so; and in the present day our churches fully testified to this. There were two great schools of architecture in Europe, the French Classic and the English Gothic; the former representing the tendency of modern Europe, whilst the latter represented the reaction in favour of the Middle Ages. With regard to the revival of Romanticism, amongst that school there was displayed at this moment an unexampled amount of energy and enthusiasm. Their ideas were very high as regarded art, but yet their platform was very narrow. Gothic architecture was extremely attractive to young minds; the youngest architects were Gothic architects, and Classic architecture with them was entirely out of fashion. In France, however, it was entirely the other way. Classic design, too, had almost disappeared in England. Our monumental art and our ordinary art were entirely different. The Gothic architecture of the present day was extremely ambitious, and therefore eccentric and *bizarre*. The leaning of the leaders of the Gothic school had been towards thirteenth-century architecture and the French Gothic, but a new school has now sprung up. We are driven back upon the adoption of a crude, rough, and rude mode of design in order to escape the imputation of weakness. The public of late years have become both alarmed and astonished at our position; and the profession is becoming very unpopular, there being every evidence of a general distrust. But the fashion in architecture must change; it never had stood still, and it was vain to think that it would. In conclusion, he thought that the reaction would be towards the adoption of the French Classic style, because that was the modern European manner, from which we had gone away and to which we must ultimately come.

Mr. Browning agreed entirely with the substance of the lecture, and believed that the fashion in architecture would change, and that there would be a fine future before the young architects of the present day.

The Chairman, in proposing a vote of thanks to the lecturer, said that different styles of architecture were governed by tradition, and that in the presence of criticism not founded upon real canons of taste, it was impossible for any art to flourish and occupy that position which it ought to occupy.

THE DUBLIN PORT AND DOCK IMPROVEMENTS.

FROM a report just issued of the Dublin Port and Dock Board, detailing a variety of statistical and useful information, we learn under the head of "Improvements" that the eastern extension of Sir John Rogerson's Quay is finished, and the deepening of Great Britain Quay is making a satisfactory progress. About 250 ft. of the wall are complete, and during last year the sum of 26,001*l.* was paid on account of these works, making a total payment already of 65,379*l.* 1s. 9d. Of the north-wall extension of the quay-wall, 300 ft. are complete, and blocks laid to the further length of 120 ft. About 600 ft. of quay-wall have been built on the works for deepening the steam berths. New steam-dredges have been at work for some months past. The wharf for the coal trade is finished, and the contractor has been paid his balance of 3,577*l.* 19s. The wharf adjoining the Bristol and Glasgow Company's berth will be extended 90 ft. to give accommodation to sailing vessels. Further, a range of vaults for storing whisky, extending from the Dublin and Drogheda Railway terminus to the main entrance to the docks in Amiens-street will be constructed at a cost of 4,985*l.* A piece of ground has been sold by the board to the railway company to enable them to construct an inclined roadway adjoining the terminus. The amount due on mortgage bonds towards the expenditure incurred in the improvement of the port was 94,000*l.*

In Dublin, also, in connexion with the Holyhead traffic and the Irish inland traffic, the Midland and Great Western Railway Company have been for several months prosecuting some important engineering works for the better development of their goods traffic *viâ* the Liffey branch of their line. These improvements will give that line great facilities by placing it directly in communication (alongside of the Royal Canal) with the Liffey. The canal was purchased several years ago by the Midland Railway Company.

New British Institution Gallery, Bond-street.—An interesting collection of cabinet pictures will be found here just now on sale. It includes a number of oil pictures and water-colour drawings by artists who have worked with Fortuny at Rome, and there established a rising school for colour and character.

ON THE PRESERVATION OF WOOD BY MEANS OF TAR.*

IN a previous number, says the *Moniteur Scientifique*, we published a memoir on the preservation of timber for purposes of construction. All the methods of preserving wood hitherto in use were therein noticed; but whilst some were treated at considerable length, others were touched upon very slightly. In the latter category was the preservation of wood by means of tar. We believe it may be of service to our readers to treat the subject more fully, and we have, accordingly availed ourselves of the writings of M. Melsenns, member of the Académie Royale de Belgique, of the Philomathic Society of France, &c.

In August, 1848, M. Melsenns directed attention to certain facts connected with the conservation of wood with the aid of substances insoluble in water and unalterable under the ordinary influences of atmospheric air and moisture. The type of these substances chosen by M. Melsenns was resin, pitch, and tarry products generally, such as we find unchanged after a long succession of centuries in Egyptian mummies.

In a subsequent number of the *Bulletin* of the Belgian Academy of Sciences, the same learned writer gave an account of some experiments instituted by him and of the results thence obtained. These we propose to review briefly.

In the winter of 1840-41, M. Melsenns prepared some blocks of wood 40 centimetres (14·9 in.) long, and 25 centimetres (9·2 in.) in thickness, which were thoroughly impregnated with gas-tar, by a repeated process of heating and cooling. These prepared blocks were then buried in the corner of a garden, where the soil was saturated with the drainage from a urinal; there they remained for a couple of years. When taken up and split open, they were found to be perfectly sound.

In the cross-sections white bands or streaks were observed showing the places into which the tar had not penetrated; it was observed that the latter had followed the sinuosities of the woody fibres. The split-blocks were separated in halves —one set of halves was retained, and the other buried for some time in ordinary soil. The first set of halves was kept from exposure for eighteen months; the pieces were then plunged into a steam-bath at a temperature of 100° Cent. (212° Fahr.); suddenly cooled by plunging them into cold water, and set out in the frost; they were then laid out for some time uncovered on the damp surface of a lawn; then placed on the parapet of an isolated building; lastly, they were buried in a mixture of sand and mortar under a butt holding rainwater. It would be difficult to suggest or imagine a concatenation of circumstances more favourable to decay, than the alternations of dryness and humidity to which they were thus continuously exposed. But, according to the reports of all who inspected them, they were perfectly sound and uninjured after *twenty years'* trial.

M. Melsenns also gave portions of the same blocks to M. Rottier, who placed them in his rotting-vats. He reported to M. Melsenns as follows:—"Small portions of your blocks were destroyed in my vats at the expiration of 240 days or thereabouts; but it should be observed that blocks of a precisely similar description, and not so prepared, lasted 120 days at furthest.

These facts deserve the attention of railway directors, who still not unfrequently neglect this department of their service. With M. Melsenns, we regret that experience acquired in this matter on lines of railway is not always made public. The Belgian Government, for example, tried a dozen different methods of preserving wood; but a special Commission appointed to investigate the subject was directed to devote its attention to the following matters:—1. The durability of oaken sleepers in their natural state, and impregnated with creosotic oils by Bethell's process. 2. Ditto, of blocks of beech and red deal prepared in a like manner. M. Melsenns also observes that it is to be regretted that the reasons which led to the abandonment of the "Boucherie" process on Belgian lines of railway since the year 1859 have not been given in the reports of the railway administration, as such reasons would have afforded reliable data for future experimentalists to go upon.

Useful information might be obtained in another way. We know that the renewal of the material is most frequent with certain woods and upon certain lines of railway, and we are disposed to agree with the observation made by M. Melsenns in 1848, that "an exhaustive study of all the circumstances that contribute to render the wood unserviceable under such cases would infallibly lead to the solution of this great question; at any rate, careful researches into the more immediate causes could not fail to be of infinite value."

In a pecuniary point of view the subject is of no small importance. During the three years, 1861, 1862 and 1863, over 140,000 sleepers were put *hors de service* on Belgian lines; in 1860-62 the number was 150,000; so that there is no exaggeration in assuming that the future expenditure may be reckoned at 150,000, which, at 5 francs a piece, represents a sum of 750,000 francs (31,250*l.*). It must be understood, that up to 1864 not more than one-third of the sleepers on the Belgian lines were prepared in any way. Of course the estimate above given must be reduced as the proportion of the prepared sleepers becomes greater. However this may be, the total number renewed between 1839 and 1862 was 1,849,781. Of these, 1,081,000, at 5 francs each = 5,405,000 francs; 761,000 at 3¼ francs each = 2,885,000 francs; making a total value of 8,290,000 francs (331,600*l.*). But the question is by no means as simple as it appears here; neither would it be all unalloyed gain if the sleepers lasted for an indefinite period.

M. H. Maus published an interesting paper upon the subject in the *Annales des Travaux publiques*, vol. iv., 1846. Without going minutely into the details, we may observe that, according to M. Maus, the annual cost of a sleeper is made up of two separate elements,—1, interest on the prime cost; 2, an annual reserve, which at interest should reproduce the sum required to purchase a new sleeper when the time comes. On this point the reader may consult M. Maus's paper, and the accompanying table, based upon a formula prepared by M. Emery. The formula, however, needs completion. As it now stands, no account is taken of the money-value of the discarded sleepers. The sound portions of oaken sleepers, for example, may often be turned to account for other purposes along the line,—fences, barriers, posts, and such like, and for fuel. Sometimes a discarded sleeper purchased in a good year will fetch as much as the price of a new one; but, as a rule, they are not worth much. As fuel, a sleeper prepared with gas-tar will be valuable in proportion to the tar contained in it. Hence, the data in M. Maus's table are not altogether exact, and must be taken as representing the *maxima* of result. In every case, however, the cost will be less in proportion as the durability of the sleepers individually is greater.

A correct formula could only be prepared with the aid of long experience in the working of lines of railway, due regard being paid to all the conditions involved, such as the cost of labour in laying and replacing, the choice of the wood, the prime cost and the durability of each sort, the nature of the soil in each case, &c. The cost of preparation should be as much less in proportion as the wood in its natural state is more durable. The hesitation of the railway authorities and the need of experience are explanation sufficient of how it came to pass that in 1864 only 37·77 per cent. of the sleepers on Belgian lines of railway were prepared in any way.

A section of a piece of timber impregnated with tar presents some curious and very distinctive characteristics, according to the duration of the process of injection and the amount of tar injected. In every case the injected tar follows the lines and sinuosities of the longitudinal fibres. When injected in sufficient quantity it fills the pores altogether; when, on the contrary, the process has been incompletely performed, which, however, is generally sufficient, the tar accumulates in the transverse sections, and plugs the channels that give access to deleterious agents.

In the large blocks of beech and other soft woods, bands were observable marking where the tar had not penetrated. Still, despite the severe test to which they were exposed, these blocks kept sound at a very slight depth below the surface of the ground.

It should be remarked that it is always best that the wood should be put in shape, and in sleepers, that the mortises for receiving the chairs, and the holes for the dowels, wherewith the latter are fixed, should be made before injection.

The experiments made by M. Melsenns on oaken blocks, exposed to the fumes of liquid ammonia, show that the conservating fluids follow the precise course that would be taken by decay. To our great regret, want of space forbids us to follow the author into the details of the experiments executed by him, or to reproduce the figures given in the original memoir. Suffice it to say, that in wood thus treated, the tar acts on the very parts first exposed to injury, and on the course that would be taken by decay, which is thus rendered impossible. We may add, that a working engineer, with whose assistance M. Melsenns attempted to split the blocks thus prepared, considered the resistance equal to, if not greater than, that of ordinary oak. Several small nails, in the substance of the wood were found entire, and not at all rusted—a peculiarly favourable circumstance that deserves to be specially noted.

Whatever the nature of the wood, rot, wet or dry, spreads rapidly in the direction of the *length*; its transverse progress, in the direction of the medullary rays, is less rapid. Sleepers are thus often thoroughly rotten, although the outside shell may appear sound and uninjured. We frequently find them decayed in the lines of prolongation of the dowel-holes, and yet sound everywhere else. When sleepers are not dressed, the process of decay is observed to be delayed in all ordinary woods. In oak, where the fibres run in the direction of the dowel-holes, the portions of the wood below the latter are often stained black with a sort of ink formed by the rust of the iron dowels acting on the tannin in the substance of the wood. These blackened lines do not run straight, but in each case follow the line of the first series of longitudinal vessels reached.

Saw and hatchet cuts, and all other injuries causing a solution of continuity in these longitudinal vessels, tend to expedite decay. In 1843–44, when the wooden pavement in the Rue Croix des Petits Champs, in Paris, was taken up, all the blocks left exposed on the ground were decayed at top and bottom: an injection of tar, however incomplete, would have prevented this injury to the wood.

In his "Memoir on the Conservation of Wood" (*Bulletin de l'Académie Royale de Belgique*), M. Rottier has endeavoured to determine by which of the numerous substances contained in coal-tar, this special action is exerted; but, whichever it may be, the experiments of M. Milsenns sufficiently testify to its practical utility. Neither need we lay too great stress on the substance with which the wood is to be impregnated, so long as it will not volatilise except at a high temperature.

M. F. Kohlmann (*Comptes Rendus*, June, 1863) has directed attention to the employment of tar in the conservation of every description of building material. He shows that tar, or, better still, pitch, stearic acid, and the like, might be substituted for water in mixing plaster, and that the admixture, although mechanical, is so intimate that the benzine, and other substances in the pitch, are often found imperfectly crystallised in the plaster. The process of impregnation with gas-tar above described, must have a somewhat analogous effect, as M. Rottier found that chips thus treated would not bleach under the action of ether. They remained of a deep brown colour, and under the microscope, the woody fibre of the cells was found to be stained with the tar.

However this may be, M. Kohlmann ascribes the practicability of employing these substances in plaster, in place of water, to the property they possess of intermixing intimately therewith. The experiments of M. Melsenns show that neither mercury nor sulphur possesses this property. In the specimens of injected woods exhibited in 1848 were pieces impregnated with mercury, with sulphur, and with "Darcet's metal." It would be interesting to ascertain to what extent timber thus prepared might be employed in shipbuilding and in mines. As regards woods impregnated with fusible alloys, their economic value is very small, being limited to marqueterie-work and the like.

Everything tends to show that the conservation of wood deserves a place in the foremost rank of questions affecting public economy, and that up to the present time the subject is very far from having received a satisfactory solution. A sleeper should last as long as a mummy.

The methods of injection suggested by M. Melsenns in 1845 did not answer equally well with every kind of wood. After trying wooden blocks in every sort of condition,—dressed and in the rough, green and dry, sound and decayed,

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* *Moniteur Scientifique*, January, 1873.

M. Melsenns found that alder, birch, hornbeam, beech, and willow were easily and completely impregnated; deal sometimes resisted the process, the innermost layers remaining white; poplar and oak offered a very great resistance,—indeed, with poplar it was found necessary to repeat the process.

In oak it often happens that the sap-wood, or its outermost layers, are impregnated, whilst the tar has penetrated a few millimètres only into the rest of the wood. A very large block of oak, very imperfectly injected, in spite of a twenty-four hours' sojourn in a boiler, at a temperature of 120° to 140° Cent. (248° to 282° Fahr.), was left out through the winter. The workman called upon to examine it afterwards reported that he had never seen harder or drier oak. It had then been eight months in the open air. It was examined in the April following the severe winter of 1847.

It often happens that considerable portions of the wood will resist the passage of the tarry matters, but the interstices being stopped through certain parts of their length are thus rendered inaccessible to decay.

According to the nature of the wood and the manner in which the injecting process has been performed, the wood will absorb from 30 to 50 per cent. by weight of tar, when perfectly dried in *vacuo* at a temperature of 140° Cent. (284° Fahr.). This would no doubt involve considerable expense; but in most cases, as with sleepers, a thorough injection is not requisite, and the process may be repeated when signs of decay begin to show themselves.

The Belgian railway regulations require that a sleeper impregnated with tar should retain 9·25 kilog. of it. It is difficult to see why a dozen kilog. of tar, deprived of all its volatile ingredients at a temperature of 150° Cent. (302° Fahr.), should not do as well as ordinary coal-tar. In the experiments with creosoted fir sleepers, it was found that 30 to 40 kilog. of wood absorbed 22·5 k. of tar.

The experiments on which M. Melsenns has based his assumption of the sufficiency of a *superficial* injection of hot tar, were executed with fifty pieces of board 0·30 m. long by 0·07 m. broad by 0·05 m. in thickness. The period of immersion in the hot tar varied from fifteen to twenty minutes. The matters employed were ordinary gas-tar, and gas-tar deprived of its volatile ingredients; sometimes resin was added. On coming out of the hot tar, the boards were plunged in cold liquid tar; afterwards they were dried in a hot bath. Oak, fir, beach, hornbeam, and poplar were used.

Wood in its natural state, from the Veterinary School, where it was more damp than in an ordinary store, was prepared, dried, weighed, placed in boiling water for twelve hours; then left exposed; and weighed from time to time. The results were as below :—

First Series of Experiments.

Average weight of the prepared wood (mean of 20 experiments)	100
Ditto, after immersion in boiling water	120
Ditto, after fifteen days' exposure	107
Ditto, after two months' exposure	94
Ditto, after three months and a half exposure	89
Ditto, after nine months and a half exposure	91

The weights of similar blocks, not prepared, under like treatment, were,—100, 136, 99, 86, 84, 85. A mean of five experiments.

Second Series of Experiments.

Average weight of the prepared wood (mean of 20 experiments)	100
Ditto, after a month in sandy soil, always damp, and sometimes saturated	111
Ditto, after two months' exposure at noon-day in the months of July and August	97
Ditto, after six months under cover in the laboratory of the Veterinary School	98·5

The weights of similar blocks, not prepared, and treated in like manner (a mean of five experiments), were,—100, 127, 89·5, and 91.

These data show that wood hastily prepared and very imperfectly impregnated lost and gained *less* moisture than ordinary wood in its natural state, in like times, and under like conditions.

As regards the sort of wood, it was found that oak absorbs and loses least; fir ranks second; beech and other soft woods come third; and hornbeam fourth.

Further experiments in regard of this point would be useful.

Superficial injections with hot tar appear to differ essentially in their effects from ordinary tarring with the brush. Under the microscope, the difference is very strongly marked.

In conclusion, we give M. Melsenns' deductions from the experiments above referred to :—

"We may inject the whole or any part or parts of the wood, green or dry, dressed or in the rough, by preparing it either by chemical agents, or the natural process of seasoning, employing the pressure of steam, or of the atmosphere, as the mechanical power, and heat as a solvent or liquefier of the preserving substance.

The latter will always take the course that would be followed spontaneously by decay.

The superficial carbonisation of the wood is always more effective when produced with the aid of tarry matters than by the simple action of heat (charring), which decomposes a portion of the wood.

When the injection is superficial, the wood should always be put into shape first.

A railway sleeper thus prepared should have a long, if not indeed an indefinite existence, if exposed to the inroads of decay alone; but, in practice, we have to take account of mechanical causes of injury as well."

DRINKING FOUNTAIN FOR ALNWICK.

IN 1871, the Alnwick Local Board of Health desiring to remove an unsightly octagonal stone erection, 10 ft. in diameter, of the date of 1780, called "Pottergate Pant," which stood on a conspicuous spot in the town, at the junction of Narrowgate-street, the main street leading to Alnwick Castle, with a picturesque and steep street called Pottergate, that body obtained a design for a new "pant." It was then discovered that, at the establishment of the Board of Health, twenty-five years or so ago, this and all the "pants" in the town were given up by the Corporation of the town to the Board for "use and maintenance" only, and the Corporation now claimed to have a voice in the selection of the design for the new erection, although they were not to pay for it. The Board objecting, the design was withdrawn, and nothing was then done. The question cropped up again last year, when, on the proposition of the Corporation, the Board reluctantly consented to a design submitted by the former, and the unsightly erection was removed. The design of the Corporation, however, being of no artistic merit, and merely for a cast-iron erection apparently taken from a trade-book, considerable dissatisfaction was expressed at the opportunity likely to be lost for the erection of a fountain that should be a credit to the town. A project was then mooted to erect by subscription a handsome granite fountain, which met with decided success, when at this stage Mr. Wm. Dickson, F.S.A., the clerk of the peace for the county and the chairman of the Local Board, volunteered to provide a granite fountain at his sole cost. In order to satisfy both the Corporation and the Board on the question of the design for his fountain, Mr. Dickson issued advertisements, offering a premium of 5*l.* for the best design based upon a printed specification of particulars which were to be obtained from him. These particulars were, in the main, that the accepted design was to become his property, and the author was to be employed to carry it out; that it was to be in red polished granite or a mixture, and 11 ft. high to the base of a catoptric lamp, which he would provide for the summit of it; that it was to be about 4 ft. square at the base, with troughs and drinking-cups; that it was to be plain and substantial, of the Edwardian character; that the cost was not to exceed 100*l.*; and that the design was to be fixed upon by a joint committee of members of the Board of Health and the Corporation.

In response, fourteen designs, illustrated by twenty-five handsome drawings, by eleven competitors, hailing from London, Glasgow, Inverness, Newcastle, and Alnwick, were received at the appointed time. Mr. Dickson, having obliterated all signatures and everything that would give a clue to the authors of any of the designs, handed them over to the joint committee, composed of five members of the Local Board, one of whom was Mr. F. R. Wilson, architect, and who was not a competitor, and five members of the Corporation, giving to them absolute powers to select a design and to carry out the work.

The joint committee, after appointing Mr. G. Cockburn chairman, and Mr. James Heatley secretary, and devoting considerable time and care at three several meetings, have, after eliminating from the competition all those designs that were not in accordance with the specification, finally adopted a design of considerable artistic merit, whose author is Mr. D. Macmillan, a local sculptor, and which came under the motto, "We live to learn." It is about 4 ft. square, two-thirds up, with lancet-headed cusped panels in the centre, whence are suspended the drinking-cups. The upper part rises out of the square into an octagon, with a quatrefoil in the front face, and a plain octagonal pyramidal roof, terminated with a finial, which carries the lamp-pillar. The lower parts of this design, including the trough for "skeels," and niches for dogs and cattle to drink from, are to be red polished granite, and the upper part of axed granite. The finial termination is to be of carved hard stone. It is to be erected for 100*l.* This, the selected design, is one in the competition which strictly conforms to the specification, and has thus fairly won the premium and the honour of carrying out the design.

One matter yet remains to be settled by the joint committee, viz., the inscription. It was the wish of the donor that it should stand simply thus,—"The gift of William Dickson to the town of Alnwick, 1873." The corporation would like the word "corporation" in lieu of "town." As a middle course, "Erected at the cost of William Dickson, esq., in place of the old pant, 1873," with his monogram on a shield on the front, and the arms of the corporation (St. Michael) on a shield in the rear, would perhaps answer the purpose.

COUNTRY HOUSES: MILNER FIELD, YORKSHIRE.

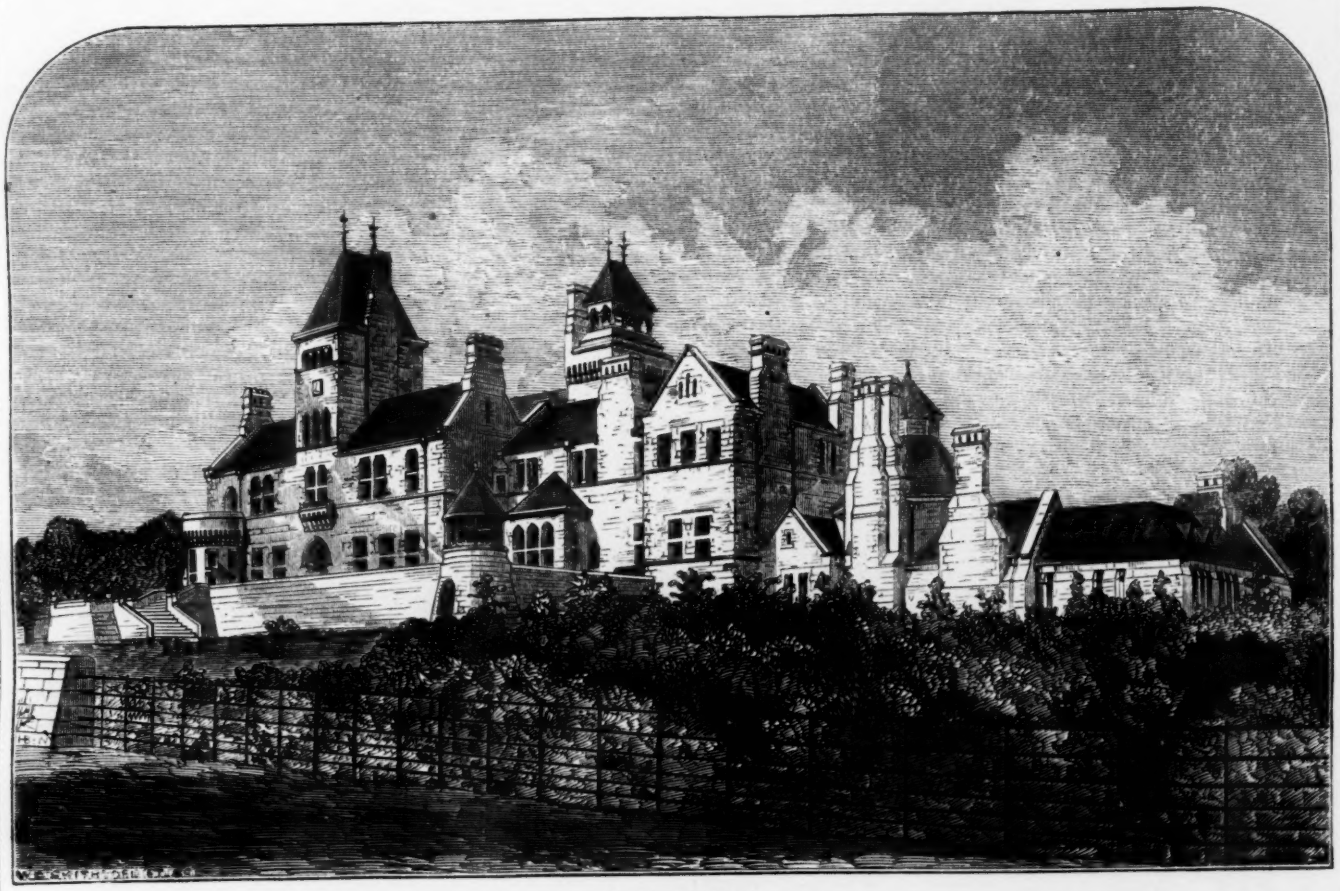
THIS house, the residence of Mr. Titus Salt, is situated in the parish of Bingley, and near to the village of Gilstead. It occupies a prominent position, overlooking the valley of the Aire, and commands extensive views of the surrounding country. The house stands in a newly-formed park, and is approached by a new road, communicating with Saltaire on one side, and with Gilstead and Bingley on the other. A small Domestic building, of about the seventeenth century, which had been altered and modernised from time to time, and possessed but little interest, stood near the site. This has been pulled down, but its name, "Milner Field," retained.

The new building is placed almost due north and south, the entrance being on the north side, through a massive gateway into an enclosed courtyard. The principal rooms face the south, and open on to a wide terrace, with flights of steps leading down to the park. The house is built of local stone, with brick linings, forming hollow walls. The roofs are covered with Whitland Abbey green slating. Some of the rooms have moulded open ceilings of oak, and the woodwork of the principal rooms is either wainscot oak or chestnut. Burt & Potts's casements are fitted to the opening windows. The entrance-hall and corridor are faced with stone in party colour. The Old English type of plan adapted to the present requirements has been adopted, and the whole treatment of the work has been kept in harmony with this, all the fittings and much of the furniture having been made from special designs. The internal decorations are now in progress.

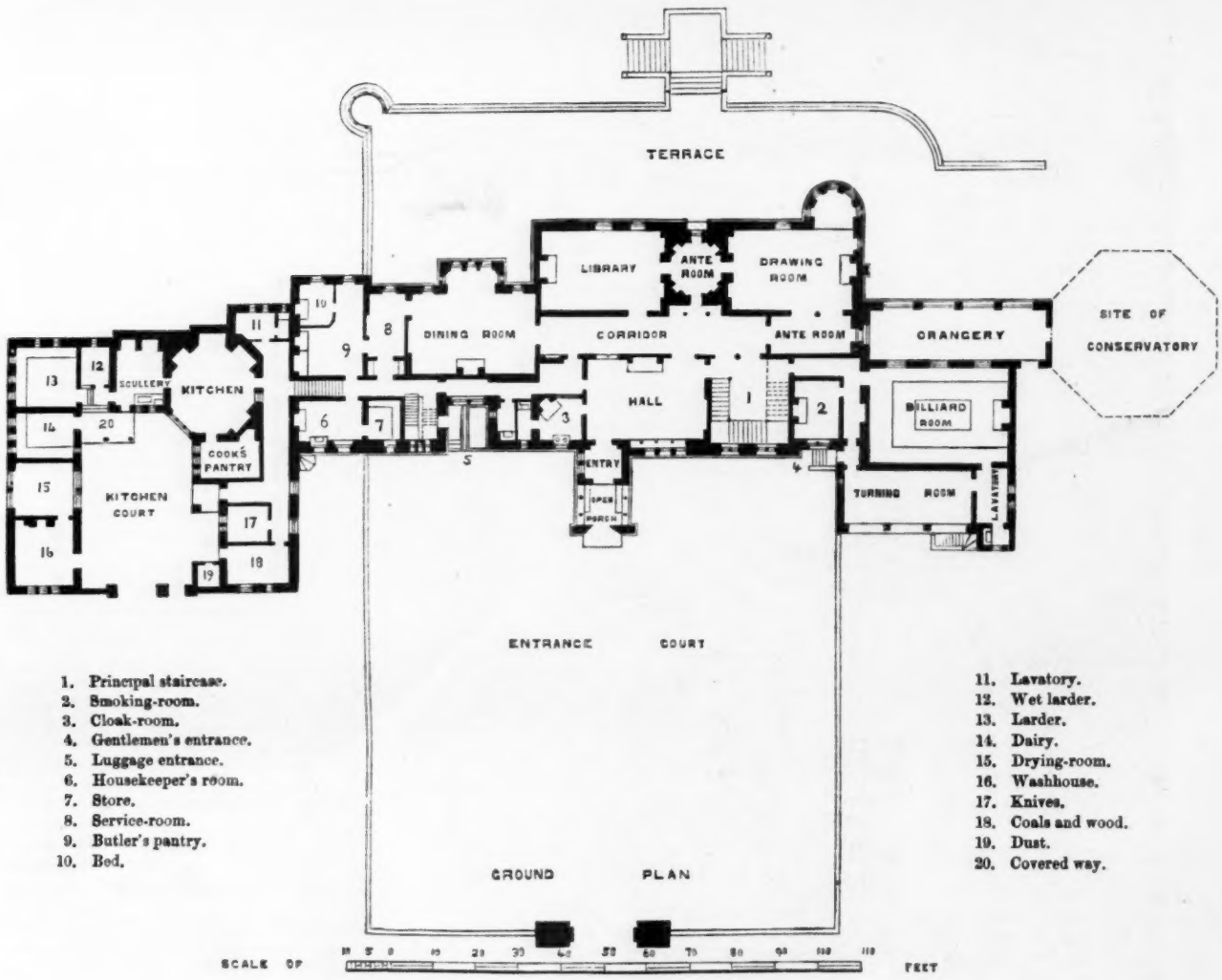
Near to the house, and adjoining the Gilstead Lodge, extensive stabling has been erected, and at the lower end of the park are model farm buildings. The kitchen-garden, with an extensive range of houses (to which we referred recently), is placed at the upper end of the ground, opposite the principal entrance, with the carriage-road between. Messrs. Shaftoe & Barry, of York, were the general contractors. The wrought metal-work was manufactured by Messrs. Richardson, Slade, & Co., of London. Messrs. Burke & Co., of London, supplied the chimney-pieces and marblework. Mr. T. Nicholls, of Hercules-buildings, London, executed the carving; Messrs. Marsh, Jones, & Cribb, of Leeds, manufactured the furniture. Mr. T. Harris, of Gray's-inn-chambers, London, was the architect; and Mr. A. Thorne acted as his clerk of works.

Machine Labour in Mines.—There is in the *Bulletin de la Société de l'Industrie Minérale*, a memoir, "On Compressed Air Borers for sinking Shafts," by M. Chanselle, especially as applied to the mines at Sarrebrück. All the results are carefully compared with those obtained by manual labour, and they deserve especial attention at this time, when the substitution of machine labour in mines is exciting much attention.

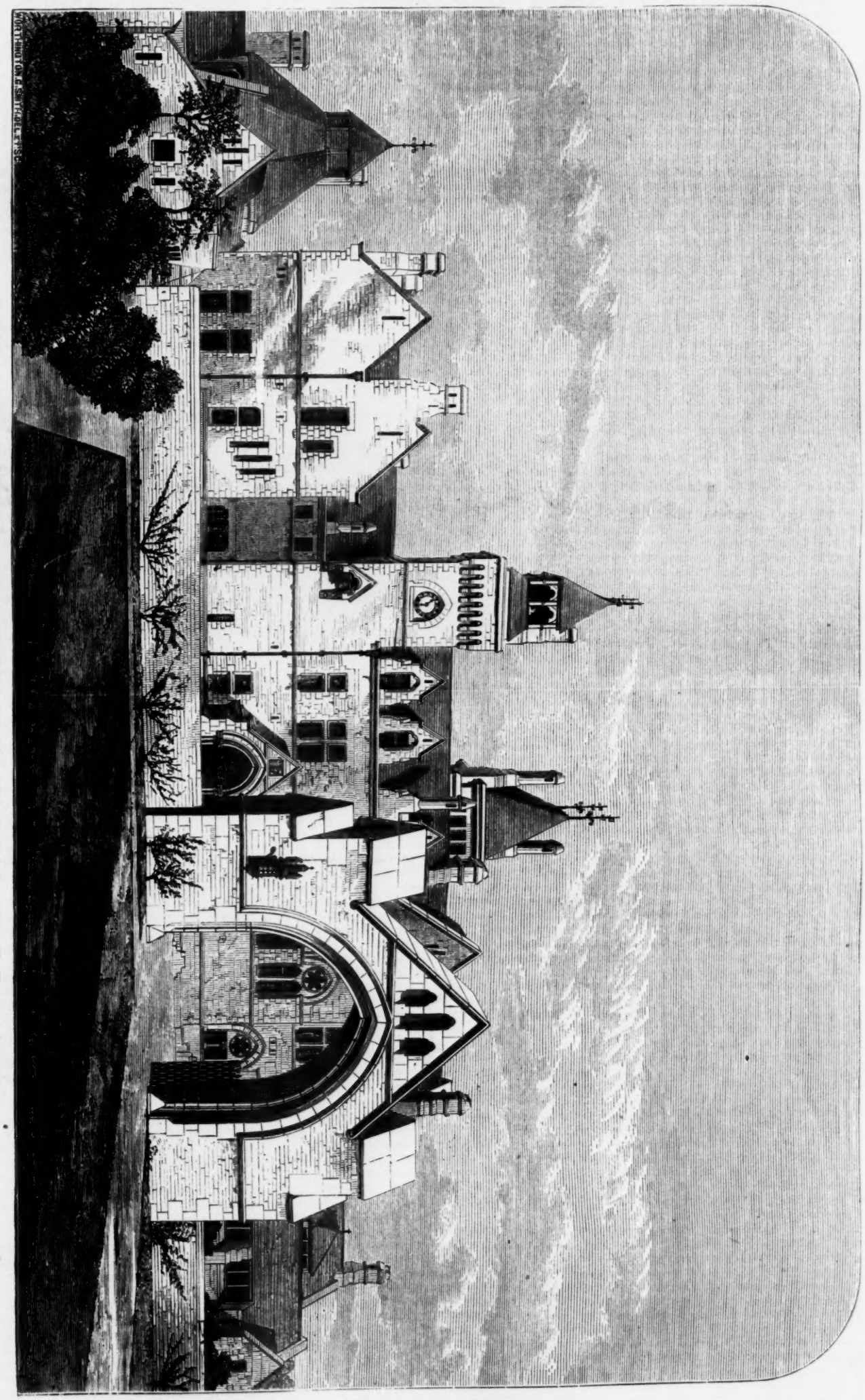
MILNER FIELD, YORKSHIRE.



PARK FRONT.



1. Principal staircase.
2. Smoking-room.
3. Cloak-room.
4. Gentlemen's entrance.
5. Luggage entrance.
6. Housekeeper's room.
7. Store.
8. Service-room.
9. Butler's pantry.
10. Bed.
11. Lavatory.
12. Wet larder.
13. Larder.
14. Dairy.
15. Drying-room.
16. Washhouse.
17. Knives.
18. Coals and wood.
19. Dust.
20. Covered way.



MILNER FIELD, YORKSHIRE: THE RESIDENCE OF MR. TITUS SALT.—MR. T. HARRIS, ARCHITECT.

THE CASTLE OF PONTEFRACT.*

DESCRIPTION.

THE position and dimensions of the castle were worthy of the great barons by whom it was constructed, and far too noble for the events with which its name is associated. North-east of, and one-third of a mile from, the market-cross of Pontefract, there is seen a very remarkable table of rock, oval in form, the sides of which are in part a steep slope and in part a cliff of from 30 ft. to 40 ft. high, rising out of a talus, which, on the north, south, and eastern faces, descends into two deep natural valleys, which unite on the north-eastern front. At the south-west end is also a natural depression dividing the rock from the town, and which has been deepened somewhat by art, as has the cliff been scarped and, where necessary, revetted, so that the general result was the production of an almost impregnable stronghold. This description, however, requires, as regards the east front, some little modification. Here, immediately beyond the wall, is a ditch nearly all artificial, and beyond it a nearly level area, beyond which, again, is the natural valley. As it was necessary to cover the ground, it was walled and converted into what was called the barbican, but was really a double ward outside the castle, covering its main entrance. The castle was thus composed of the main ward, occupying the table-rock, and the outer and inner barbicans covering its south-east front and entrance.

The main ward occupies the whole summit of the rock. It is in plan an irregular oval, 150 yards north-east and south-west, and 103 yards in its cross diameter. Of this area a segment at the south-west end, 37 yards deep, or on the "sagitta," is occupied by a raised platform containing the keep and remains of various buildings, and a smaller segment at the north-east end is occupied by the bases of other buildings, including the chapel. If the arrangement be likened to the deck of a ship, the keep end will be the poop, &c., the other end the forecastle, and the large intermediate space the waist.

The present appearance of the north-eastern platform is a bank of earth, irregular, and about 20 ft. above the area level. In plan it is rather semilunar, and is evidently composed of the basements and ruins of buildings, the soft red sandstone of which readily becomes converted into soil. The face towards the ward, standing from 2 ft. to 6 ft. high, shows the base mouldings and plinth of a range of buildings that rose from the main ward level, and seem to have included a polygonal tower or turret. All that is visible is of excellent ashlar, with stones of large size, and the workmanship is mainly in the Perpendicular style. In the rear, along the edge of a cliff, is the curtain-wall, part of which is a revetment filling up the irregularities of the rock. This platform is returned a few yards along the east front against the curtain, and there is seen the basement of St. Clement's Chapel, more than once rebuilt since its first Norman foundation.

The curtain along the crest, where the cliff is high, seems to have been a mere parapet. On the north-east point, where there is only a slope, the curtain is very lofty, and of prodigious thickness; much is broken away, but what remains shows it to have been 15 ft. thick at its base and 11 ft. at 24 ft. high. The main gate was in this curtain near the south end. It seems, from the drawings, to have been covered by a small square tower, the exterior and interior portals not being opposite.

The main interest of the castle attaches to its south-western platform. This is about 20 ft. above the main ward, and at its southern angle there is raised upon it a conical mound, flat-topped, and rising about as high again.

Towards the main ward this platform is supported by a revetment wall from 12 ft. to 14 ft. high, of good rough ashlar, of large stones, having a base of 4 ft., and above this a plinth of about 4 ft. more, the two offsets being plain chamfers. This, no doubt, carried a curtain-wall. In the wall, near its centre, is a broad-arched recess, called "the King's Seat," probably from a tradition that Richard II. sat there, which is probable enough. At the north end the platform is returned about 25 yards along the west curtain. Various indications show that this platform was covered with buildings, most of which, like the retaining wall, were of Norman date, and of which the basements remain, though much covered up. Of the *enceinte* or curtain-wall that supports the outer face of this platform only the lower 30 ft., or revetment, remains. This commences some way down the slope, and is prodigiously strong, and built against the rock. At the south-west angle was the Treasurer's or Pix Tower, the ruins of which still encumber the slope. Passing southward, the wall rises and becomes more perfect. In its exterior base, about 30 ft. below the rampart, is a Norman postern, very perfect, and which probably is in the base of the old Red Tower. Then, behind, and on the level with the top of the wall, are remains of early buildings. One presents the end of a round-headed vault of about 16 ft. span, of rude rubble, but springing from good ashlar walls, and having a later-inserted window. This is called "King Richard's Prison." Near this is a rectangular shaft, 8 ft. by 4 ft., but which, a few feet down is increased to 8 ft. square, a round-headed arch supporting the upper half. It is now about 40 ft. deep, and dry. It is called a well, but is more probably the shaft of a garderobe.

Beyond this rises the mound, the top of which is circular, and about 20 yards across, and 40 ft. to 50 ft. above the main ward, and much more above the exterior base of the *enceinte* of which it forms a part. Those who formed the mound no doubt gave it a natural slope all round, and placed their structure on its top, and, making it a part of their line of defence, carried the general palisade to its summit from either side. The Normans, on taking possession, proceeded in a different way. They cut the soft rock, forming the core of the mound, on the outer sides, into the figure of a three-quarter round mural tower, and then faced it with a very solid wall, so that though really a solid bastion, it had all the appearance of a magnificent round tower, 70 ft. diameter. When this segmental bastion had been carried to a height of 50 ft. or 60 ft., that is to the level of the top of the mound, the wall was continued round, and the cylinder completed, so that the mound was crowned by a regular shell keep of 60 ft. diameter, and probably 25 ft. high, which was really, what its substructure only seemed to be,—a tower of masonry. As the rock was of irregular figure, this process was repeated, and a second smaller bastion was formed to the north, and probably a third. Leland speaks of the donjon as composed of three large and three small roundets. However, only two now remain. These grand bastions still form the finest part of the castle, standing as they do high above the road from the railway station into the town, upon the crest of a steep slope. They are faced with large blocks of sandstone, of excellent open jointed ashlar work, with a bold set-off at the base. Advantage was taken of the soft character of the rock to excavate the interior into cells and staircases, some of which are still open. In the large bastion, at its exterior base, near a covering angle, a shoulder-headed doorway, a postern, opens into a round-headed passage, partly cut in the rock, and partly vaulted. From this one way leads into a mural chamber; another up a steep flight of steps, cut in the rock, but having a series of shoulder-headed hanging arches to support the roof. At a height of 30 ft. this stair leads to an open gallery above, commanding the postern, and from this again ascends, covered, to the base of the keep proper. Boothroyd gives three other excavations, one of which contained the well mentioned by Leland. Besides these the remaining fragments of the keep proper contained the base of a well-stair, probably ascending to the battlements, and a shaft, probably from a garderobe about that level.

The main entrance to the castle was a few yards east of the keep in the south curtain. From the gate a narrow stair ran up the curtain into the keep, and is still seen. Another, on the other side, still descends from the keep towards King Richard's prison.

From the keep a spur wall descends the slope, and was intended to cover the approach, as at Hawarden and Coningsborough. It evidently crossed the ditch, and formed part of the barbican. Thus the keep could be reached rapidly and directly by three ways, all narrow and well defended, one from the outside by a postern, another from the main gate, and a third from the west ramparts. In substance the masony and arrangement of this keep is clearly Norman, but the whole has been refitted, and no doubt refaced in the Perpendicular period.

Mention must be made of a very curious and early excavation in the main ward. On the surface, a few feet from the king's seat, a flight of rock-cut steps descends nearly north-west, and at 70 ft. distance is the mouth of a square shaft, lighting a passage below. Descending, thirty-three steps lead steeply down a passage, 4 ft. broad, with a hanging roof. A little way down, on the right, are traces of a cylindrical staircase, no doubt the original way in, but now, with the tower, in the base of which it no doubt was, destroyed. At the foot of the stairs is a plain round-headed door-case, apparently of Late Norman date. Beyond this the stairs recommence, and ten steps lower the descent ceases and the passage forks, a short branch running north, and another, a trifle longer, east. Before the fork, part of the passage is vaulted in fine-jointed ashlar, with two plain round-headed ribs. In the wall, on the right, is a round-headed recess for a lamp, and the commencement of another passage, also round-headed, but left as a mere recess. Above the fork opens the shaft, here seen to be a truncated pyramid, about 6 ft. by 12 ft., and 30 ft. deep. At the fork the salient is occupied by two small oblong cells, with pointed roofs. They communicate with each other and the passages by narrow lancet doorways. The excavation is now called the magazine, and no doubt was so used at the siege; but it is of Norman and Early English date, and probably was intended for a cellar. The arrangements of the cells are scarcely suitable for a prison. The present entrance is clearly an addition.

There remain some exterior points to be noticed. Leaving the keep by its postern, and going north-west along the foot of the west face, the wall is seen evidently to be Norman, and near the centre of this front is the original Norman postern. There are upon the face of the wall two broad shallow pilaster strips, 8 ft. broad by 6 in. projection, between which is a plain round-headed relieving arch, and below it a segmental-headed doorway, of 4 ft. opening, without portcullis, but with a rebate for a door, and holes for two stout bars. This opens into a straight vaulted passage, about 5 ft. broad, lofty, also round-headed, of excellent ashlar, and clearly Norman. It runs about 15 ft., and is then choked up. It no doubt ends in a well-stair, which might readily be excavated. In later, probably Perpendicular times, this postern has been disused, and the door converted into a loop, and blocked with the usual window-steps within.

Following the base of the cliff along the north front, it is seen to have been carefully made good with masonry; and at the north-west angle, under what was Queen's Tower, a large rift in the rock has been lined with ashlar, and spanned by a round-headed arch in good masonry. It looks like a large cavalry postern, but is merely a recess. At the foot of the talus on the west front, and about 180 yards outside the wall, are the remains of Swillington Tower, an outwork built by Thomas Earl of Lancaster, and in which he is said to have been imprisoned. About half of the basement remains. The tower was 46 ft. square, with walls 10 ft. 6 in. thick. It was intended to command the approach from the north, and was of great use during the siege as a flanking defence. Doubtless a double wall connected it with the main ward; but of this there is no trace.

It would seem that at Pontefract, as at many inland castles, a dam was thrown across a valley below the place, and thus provision made for defence and for the working of a mill. This seems to have been the case here below the northern front. The valley was converted into a lake, employed to feed two mills, of one of which traces remained in 1806, and the other, the lower mill, was removed in 1766, when the dam was levelled, and the pool converted into a meadow. Bubwith Bridge, no doubt, crossed this pool, at what is still called "the Wash."

Nearly all traces of the Barbican are gone, but its memory and site are preserved in Barbican House, Row, and Garden, and there remains a fragment, probably of the lower gate, between Ass Hill and the Castle chain. There were two approaches, one from the town and one from the great church, which met in the outer ward of the Barbican. In front of the north entrance there still remains a good but late Tudor House, into the front of which has been inserted a grand old stone heater shield, bearing the three lions of England and a label of three points, carved in bold relief, a relic probably of the royal occupation of the castle. The style of the shield is Early, and the blazon points to the eldest son of a king of England before Edward III. introduced the lilies of France.

* See p. 16, *ante*.

Boothroyd's bird's-eye view gives a general notion of the castle before it was destroyed. There were eight mural towers,—the Keep, the Red Tower, the Treasurer's or Pix Tower, Swillington Tower in advance of the wall, the Queen's Tower, the King's Tower, Constable's Tower, and the Gate-house. All, save the keep, were rectangular, perhaps Norman. Of these only the keep and the ruins of Pix Tower are traceable: the rest, with the great hall, kitchens, and lodgings, were carefully removed by the Parliamentary contractor, though probably a few pounds spent in excavation would still show the basements, and establish a general plan.

Looking to the general evidence afforded by the remains of this castle, it is clear that it was a strong place in pre-Norman times; those who fortified it placing the mound at what was naturally its weakest point.

The greater part of the remaining masonry is Norman, and not improbably early. The *enceinte* wall, the buildings connected with it on the west platform, the rear wall of the platform, the old postern, the interior of the keep, and the magazine, all seem to be in substance Norman. Of the Early English and Decorated periods very slight traces are left visible; but it is clear that under the House of Lancaster, in the Perpendicular period, much was added. Probably, the buildings on the north-east platform were constructed. St. Clement's Chapel was rebuilt, Swillington Tower added, the keep refaced, and much done in repairing the chambers and staircases within.

Boothroyd, whose history, with all its imperfections, should be mentioned with respect, gives a copy of the account rendered for the destruction of the works, a plan of the siege operations, and a bird's-eye view of the castle.

Ruined as is the place, and reduced to be a mere garden of liquorice, enough remains to interest very deeply those who are conversant with our ancient military structures, and especially such of them as are of Saxon or English foundation, and have been recast to suit the Norman fashions of defence. G. T. C.

PROVERBS FOR GENERAL CIRCULATION.

THERE are always plenty of persons ready to assist those who are not in need.

If giving away what you do not want be charity, there is plenty of it.

Weep through life and you'll not have many mourners.

Laugh if you are hurt, lest kind souls kill you with pity.

If young men and women were courageous enough to confess to one another as much as they mask under valentines, what a deal of trouble they would save the Post-office.

"You rogue!" is often on the lips of one.

The turbid pool reflects the heavens better than the brook.

How satisfied people must be with themselves: they are always recommending others to do as they do.

"Hats off to Folly! kick Wisdom!" has long been a command.

If people were to attend to everybody's kind advice, they would never get on in the world.

Many say, "Get from behind me, Satan," when he is right in front of them.

If you profess sanctity, there will be holes bored in your cell.

Small wits, like sparrows, make great chirping.

Men magnify trifles till they are frightened at them.

Let the kingdom of Self be well governed before you talk about a republic.

It is perhaps quite as well that our glass does not reflect as other people see us.

Many a man who is only dreaming fancies himself wide awake.

The sound does not cease directly the bell is struck.

Many a man's mind is darker than his cellars.

We hear an immense deal about beauty, but seldom see it.

For God's sake, do not cry, "Stop thief!" if you mean the order to be strictly enforced.

To be a master builder, your materials must be good, the foundations securely laid, and the superstructure duly proportioned; then the future will affirm your knowledge to have been accurate, and your judgment sound.

"Moderation in all things," as the scholar said to the professor who expected too much of him.

If men would take more pains to proportion themselves, their work would be more symmetrical.

Who would desire to rule slaves, but a slave-driver?

To be at the head of a nation of free men is something to be proud of.

Who mounts upon another's neck shall never rest.

The murdered are not silenced.

The interests of truth are paramount; let him who reveals it pass unchallenged.

Holloa! you who are so loud about justice! What if you had your deserts?

Forgive quickly, and you'll have the more rest.

If a sensible man, you will not do as the world does, though it look askance.

A timid rogue will get behind an impudent one, and push him more to the front.

If everybody had his own in England, there would be a great reversal of positions.

POWERS OF BOARDS OF HEALTH.

Milward v. *Redditch Board of Health.*—In this case, condensed in *Law Journal*, the plaintiff was a needle manufacturer. The Local Board, in exercise of their statutory powers, altered the road in front of his house, raising the footpath some few inches. The plaintiff objected that this was injurious to him, and offered to make the necessary alterations to remove the inconvenience; but the Board insisted that, as the alteration was generally an improvement, he could not complain.

The plaintiff filed his bill, complaining generally of injury, and praying to restrain the Board of Health from keeping the road in a state less convenient to the plaintiff than before; and giving evidence of the specific injury, that the raised footpath dammed up the water a few inches deep in front of the house, and made the basement damp, and liable to injure his needles. It was proved that a few pipes, at a small expense, and without injuring the footpath, would prevent the water being dammed up.

Mr. Southgate and Mr. W. P. Beale for the plaintiff.

Sir R. Baggallay and Mr. Methold for the defendants.

The Master of the Rolls held that the Board were bound to exercise their statutory powers so as not to cause more inconvenience to private individuals than necessary, and granted a mandatory injunction to restrain them from permitting the water flowing from the plaintiff's premises to be dammed back by the footpath.

PREVENTION OF FIRES.

SIR,—Since I first had the honour of corresponding in your journal, in the autumn of 1860, then with respect to the great fire in Tooley-street, and since upon that and other matters, I have always taken the greatest interest in any means for either preventing or stopping the spread of fire, the real and extensive loss from which is seldom now considered, our system of insurance alleviating its more painful effects. Yet the loss of such at immense amount of property going on at all times in some part of the country can be no other than a misfortune; frequently, indeed, bringing distress upon those thus suddenly thrown out of work.

Some ten or thirteen years ago I proposed an arrangement in building warehouses, &c., by which a sheet of water could at any time be caused to exist between floor and floor upon the occasion of a fire breaking out. My object is now to give a practical suggestion, by which that can be attained when required in any manufactory or warehouse in a minute or two by self-action, and at a very trifling expense. We will suppose an ordinary good wooden floor. An edging of wood or iron should be fixed round such floor and across the entrance leading to the stairs, &c., of 1 in. or 2 in. high; a water-valve, with a well-weighted lever upon the floor above, held up by cords of hemp or guttapercha, which would be carried along under the ceiling, and so arranged that upon any part commencing to burn, the cord being burnt or melted, the weighted lever would open this valve, and in one or two minutes the floor where the fire commenced and the floor above would be covered by a sheet of water of 1 in. or more in depth. Supposing the floors to be fairly sound, this cuts off all communication towards above or below, and with proper waste-pipes laid to prevent it rising higher on each floor than the height named very little damage would be done by the water, whilst any extensive progress of the fire on the one floor would bring the water through from above upon itself, just at the very point only where the fire existed.

In its application to hotels and dwellings, or warehouses and works where watchmen are kept, of course the self-action arrangement would not be adopted, but simply a pipe to flush each floor, the valve being situate outside the building, or in any convenient place, as I have before proposed in your journal. For hotels, &c., having stairs of wood, each step should have a strip fastened on above the nosing, say but ½ in. in thickness: this would not interfere with walking, but would allow, upon the occurrence of a fire, of the stairs and landings being flushed from the top downwards, and thus each step kept covered with a thin sheet of water, besides the floors where the fire would be commencing. In the case of workshops where shavings or grease is upon the floor, thus flushing the floor would prevent its rapid progress.

It is well known, that wherever good fire-proof floors are, the spread of fires is more or less prevented. Now the question is,—Will my proposal render floors and stairs fireproof for the time being? R. F. DUVAL CAMPBELL.

PUBLIC HEALTH INSPECTORS' DUTIES.

THE MADELEY UNION.

THE inspector lately appointed to make a sanitary survey of this union has presented the following statement to the Board of Guardians. The union consists of twelve parishes, and contains an area of 27,951 acres, and a population of 30,365—the most populous union in the county of Salop:—

"To the Sanitary Authority of the Madeley Union.

Gentlemen,—I have to report to you that I have commenced my duties as sanitary inspector. I have gone over the ground generally, to begin with, to enable me to make a preliminary report to you to-day [21st ult.].

Seeing how the ground lies, I propose to divide the union, for the purpose of a sanitary survey, into districts, and I submit the following districts for your approval, viz.: 1, Much Wenlock; 2, Barrow, Willey, and Linley; 3, Broseley, including Benthall; 4, Madeley, including Coalport; 5, Coalbrook Dale, including Ironbridge; 6, Dawley, including Stirchley; 7, Little Wenlock; 8, Buildwas. These seem to me to be divisions of the union dictated by the manner in which the ground lies. I propose to inspect and report to you upon each of these districts in turn, and I shall ask to be allowed to complete the inspection of each district before reporting upon any part of it, unless there should occur some urgent reason for a more partial report, which I do not foresee.

In beginning a work of this kind, under a new Act of Parliament, it may possibly be satisfactory to you if I make a short statement of the principles which will guide me in carrying out my duties as sanitary inspector.

I take it that the intention of the Public Health Act is to make it possible for all persons to live healthily whilst they do live, of whatever class they may be.

The sanitary question seems to me to be summed up in this formula,—that whatever people consume or use shall be wholesome, and that the refuse products shall be dealt with in such a manner as not to be a nuisance or injurious to health.

To this end I interpret my duties to be as follow:—

To see for myself and to report to you the source from which the inhabitants of every house procure their supply of water.

To take samples of such water as may be necessary, and to submit them to your analyst for examination as to their fitness for human consumption.

To see in what manner the refuse water and sewage of every house are disposed of, and to report to you accordingly.

To see what necessary accommodation is provided on the premises of the respective houses.

To see that houses are not overcrowded, or, if so, to suggest to the owners such structural remedies as may seem to be justifiable.

I shall wish to inquire as little as possible into the circumstances of any household, but, seeing that it is the great object of all sanitary measures to prevent sickness and disease, I shall hope to be willingly informed, when I make my survey, and from time to time, whether there have been recent cases of sickness in the house.

Generally, to prevent the commission of nuisances, or, if committed, to require their removal.

Each one of these heads requires amplification in detail in order to set forth the minor duties; but I willingly believe that on this occasion you do not require them to be stated."

When it is said that the *sanitary* question is summed up in the short formula given above, it may be strictly true that it is so, but we have been accustomed to associate with the strictly sanitary question others bearing upon it; as, for instance, the economic question, in respect of the disposal of the sewage in that manner which shall enable the authorities to derive the utmost possible value from it, as when it is applied to the irrigation of land; or, as irrigation may not be economically possible in all places, in some manner of mixing the sewage with dry earth, to make it portable, and to prevent exhalation of noxious effluvia, the house slops being drained separately away from the houses and purified before being discharged into rivers or streams. The economical disposal of the sewage is an important adjunct to the sanitary question.

THE MEASUREMENT OF TIMBER IN LIVERPOOL.

AN influential meeting of builders and timber merchants was held in the Clarence Hotel, Spring Gardens, Manchester, on Friday, the 7th inst., when the following resolutions were passed unanimously:—

"1. That this meeting has learned with surprise and regret that an attempt is being made in Liverpool to abandon the long-established custom of measuring timber by string, with a view to substitute measurement by calliper, thereby compelling the purchaser to pay for more than he receives, both in respect of timber and the carriage of same.

2. That this meeting pledges itself to oppose by every means in its power any attempt to change the old legitimate mode of measuring so long practised in the port of Liverpool.

3. That all parties who are in the habit of purchasing timber in Liverpool be requested to communicate the foregoing resolutions to the merchants with whom they do business, and protest against the introduction of a system so unfair and uncalled for; requesting that before any steps are taken in the matter, an opportunity be given to the consumers to state their reasons for disagreeing with the proposal."

Signed, on behalf of the meeting,
ROBERT NEILL, Chairman.

WINCHESTER COLLEGE HALL.

SIR,—I had no intention of saying or insinuating anything untrue, and would be the first to apologise for anything said inadvertently, or based on erroneous information.

In order to show you I believed what was written, I intend to forward you the data on which such information was based, so that you may see I had grounds for so believing.

NORTH HANTS.

IMPORTANT DECISION UPON BUILDING DANGEROUS HOUSES.

MR. JUSTICE POLLOCK last week, on the Northern Circuit, had before him a case that singularly opened up the most important points of the liabilities of builders in regard to the construction of buildings, and the leading counsel on the Northern Circuit further enlightened the building profession by their arguments and opinions on the laws of building.

The action that introduced the subject was not brought against any members of the building profession, although it may yet reach some one of them; but it was brought againt a livery-stable keeper of Sunderland, one Laverick, to recover compensation for the destruction of two carriages by the fall of a coach-house during a gale of wind, and which building was alleged to have been unsafely built.

Mr. Russell, Q.C., and Mr. Lewers appeared for the plaintiff; and Mr. Holker, Q.C., and Mr. Shield were for the defendant.

It is unnecessary to enter into the particulars of the accident further than above alluded to, but confine the report to the building interest.

Mr. Russell, Q.C., said it might have been sufficient for the purpose of the plaintiff's case, simply to prove that the damage had been done to the plaintiff's property while under the charge of the defendant; but it would be shown that the building in which the defendant placed the carriages was not properly built, and therefore unsafe. The building was erected upon a piece of ground which until covered with rubbish had been under the level of the street, and in founding the building the architect and builder did not go beneath the rubbish and into the soil beneath. The building, which was 40 ft. by 30 ft., had not been built according to the plans lodged at the office of the borough surveyor. The gable was not tied into the gable of the adjoining house; the west wall was partly old, the upper half only of the east wall was made with brick, and is 9 in. instead of 1 ft. 6 in. thick; the supports were insufficient, and the windows on the west side were left unglazed, thus exposing the interior of the building to the full force of the west wind. He contended that it was the legal duty of a livery stable keeper who requested the public to stable horses and carriages under his care for profit to provide a proper and substantial building, and that if he failed to do so he was liable for any damage done to the property under his care in consequence.

The counsel were about to adduce evidence to show that the building was not secure, when his Lordship said that the question which he proposed to leave to the jury was, whether the defendant had exercised proper care, skill, and diligence, apart from the question of the *de facto* construction of the building. The case was one of bailee for hire.

Mr. Russell, Q.C., asked if his Lordship would add to that—that if the builder did his work negligently for the purposes of this case, the defendant was negligent?

His Lordship said that was what he did not intend to do; he was going to rule the other way. If the defendant had employed a veterinary surgeon to erect his building, he would have been held guilty of negligence; but if he went to an architect, surveyor, or builder, he had done all that the law required.

Mr. Holker, Q.C., said he had a number of professional witnesses who could prove that the building was perfectly secure and good.

His Lordship said he would direct the jury that they would have nothing to do with the foundation of the building, if they were satisfied the defendant took care to secure a good builder.

Mr. Russell supposed then, that although the plaintiff could prove that the building was insecure, unless they could bring the insecurity to the knowledge of the defendant, he would not be held liable.

His lordship said if the structure were improperly built, the defendant could sue the builder of it; but the duty of a man who lets a building for the accommodation of horses and carriages was quite different from that of a builder. He ruled that the defendant's liability was that of an ordinary bailee for hire, and all that he was bound to do was to use due care in keeping the plaintiff's carriages; and if in the erection of a shed he did all he could to employ a competent builder, he would be exempt from liability for an event which was caused by careless or improper conduct of which the defendant had no notice.

Mr. Russell.—We can have no action against the builder of this insecure and dangerous structure, my lord?

His Lordship.—That is quite clear.

Mr. Russell.—We have some evidence that the defendant's attention was called to the insecurity of the building in several parts.

His Lordship said that if the surveyor of the district had informed the defendant that the building was one which could not be passed, he would be liable.

Mr. Russell said, after what his lordship had intimated, he did not think he had better trouble the jury with his evidence; but in accepting a non-suit, he asked the Court to stay execution for defendant's costs, in order to afford opportunity, with leave to move in term for a new trial.

The Judge assented.

It was understood that the motion will be to add the builder of the structure to the present defendant, when evidence will be adduced that each was aware of the dangerous state of the shed, and also to alter the nature of the pleadings.

CHESTER UNION COMPETITION.

SIR,—As one of the thirteen competitors selected by the Chester Board of Guardians for further consideration, may I be allowed to call your attention, should you not otherwise have heard it, to the present state of affairs, as gleaned from the local papers, from which it seems that, unless great impartiality is shown by the arbitrators, there is very little chance for any one who has not local friends.

In reviewing the designs, one of the Chester papers says of one design, having its motto round the Birmingham arms,—"It is no secret that this is by an architect who has designed one of the best workhouses in the kingdom." Now, sir, I beg humbly to submit that, in a competition which is naturally supposed to be under the veil of secrecy, by reason of the mottoes, this criticism is manifestly unfair, and tends to prejudice the chances which other competitors may have in the eyes of the guardians, and is surely a reason for rejecting a design the author of which has acted so unprofessionally in disclosing his name, however good his design may otherwise have been.

VERITAS.

THE PROFESSOR OF ARCHITECTURE, ROYAL ACADEMY.

SIR G. GILBERT SCOTT is about to resign the professorship at the Royal Academy, and intends to deliver his final lecture on Thursday, the 20th inst., at Burlington House. We mention this specially, so that such of our readers as desire to show their respect for the esteemed and eminent Professor may have the opportunity of doing so.

WATER-POWER ON THE RHINE.

SIR,—In his address at the British Association, Mr. Bramwell referred to the water-power at Schaffausen, on the Rhine. This, he says, "has been accomplished by erecting turbines, which are worked by the river, and deliver their power to endless ropes carried over pullies, the rope extending from nearly one end of the town to the other. This rope gives off power at the end of each street abutting on the river-bank." I understand there are other powers of a like description further down the Rhine: I shall feel obliged if any of your subscribers can tell me where.

C. E.

THE PUBLIC HEALTH ACT *versus* LOCAL BOARD LAWS.

GREATOREX *v.* WEEKS.

IN this case, heard at the Portsmouth Petty Sessions, before Messrs. John Baker and George Curtis, Charles Weeks, a builder, was summoned for an infringement of one of the bye-laws relating to new buildings made some time back by the Local Board of Health, acting in and for the borough of Portsmouth.

Mr. S. J. Elliott, solicitor, appeared in support of the information; and Mr. H. Ford, solicitor, appeared for the defendant.

Mr. Ford took a preliminary objection that the bye-laws under which the information was laid had been abrogated by "The Public Health Act, 1872." He contended that the bye-laws were made by the Local Board, which had ceased and that the "Urban Sanitary Authority" had been substituted for the Local Board; that at common law bye-laws were only operative during the existence of the body by whom they were made; and that by the Public Health Act, 1872, various powers, rights, &c., were transferred to the new authority, but no mention was made of bye-laws.

Mr. Elliott, on the other hand, contended that the bye-laws were made by the Town Council of the borough of Portsmouth, acting as the Local Board, and that this body continued to exist, notwithstanding the "Public Health Act, 1872," excepting that the new appellation of "Urban Sanitary Authority," together with additional powers, had been conferred, and that as the Act of 1872 did not repeal the bye-laws, they were still in force.

The justices having considered the matter, the following decision was read by Mr. Thomas Cousins, the justices' clerk:—

This information charges one Charles Weeks with an infringement of one of the bye-laws relating to new buildings, &c., made some time back by the Local Board of Health of this borough acting under the Public Health Act, 1848, the Local Government Act, 1858, and the Local Government Supplemental Act, 1864, No. 2.

Mr. Henry Ford has taken a preliminary objection that, in consequence of and since the passing of the Public Health Act, 1872, such bye-laws have ceased to be of any force or validity. Mr. Elliott, the clerk to the Urban Sanitary Authority of this borough, contends, on the contrary, that such bye-laws are still in force.

The question raised was very ably and fully argued on both sides, and the importance of the point, rather than any difficulty attending it, induced us to adjourn the case to consider the matter.

The by-laws in question were made by the Town Council acting as the local Board, and ever since and now the identical corporate body has continued to exist. The Public Health Act of 1872, however, gives them the new title of "Urban Sanitary Authority," and confers additional powers.

By the 7th section of the Statute of 1872, it is provided that, subject to the provisions of that Act, the Local Government Acts (under some or one of which the bye-laws in question were made) shall be deemed to be in force within the district of every Urban Sanitary Authority. The enabling enactments, therefore, remain in force. The same section transfers to an Urban Sanitary Authority "all powers, rights, duties, capacities, liabilities, and obligations" within the district, exercisable or attaching by or to a Local Board under the Local Government Acts.

By section 53 it is provided that, subject to the Act, every sanitary authority shall, as respects (*inter alia*) all matters and things to be done in pursuance of the Sanitary Acts, by such authority, stand in the same position in all respects in which, previously to the passing of the Act, any authority stood whose powers, rights, duties, capacities, liabilities, and obligations, are transferred to such authority. And by section 59 it is enacted that all powers given by the Act shall be deemed to be in addition to, and not in derogation of, any other powers conferred by Act of Parliament, law, or custom; and such other powers may be exercised in the same manner as if the Act had not passed.

There may be some doubt as to the application to the present case of the clauses in the new statute relating to the transfer of powers, rights, &c. It is, however, unnecessary to consider this point, because if such clauses do apply, then the powers, rights, &c., exercisable by the Local Board under the bye-laws in question have been duly transferred to the urban sanitary authority. If, however, such clauses *do not* apply, the bye-laws remain in force as the Act does not repeal them.

Bye-laws duly made in pursuance of a statute have practically (when not *ultra vires*) the force of an Act of Parliament, and we think that the Act of last session is intended to supplement and not (excepting as therein expressed) to abrogate the then existing sanitary laws and regulations.

We are, therefore, clearly of opinion that the bye-laws in question are now in force within the borough, and we overrule Mr. Ford's preliminary objection. The case will, therefore, proceed on its merits.

THE HOLBORN VIADUCT.

AT the last meeting of the Court of Common Council, Mr. J. T. Bedford, pursuant to notice, moved:—

"That the parish of St. Sepulchre, London, having purchased of the City a freehold site on the Holborn Viaduct, at a cost of 4,200*l.*, for the purpose of throwing the same into the public way, and proposing to expend a further sum of nearly 6,000*l.* in restoring and decorating the fine tower and interior of their church, this Court, being desirous to mark its recognition of the public spirit thus displayed, do contribute five hundred guineas towards such restoration, believing it will constitute a magnificent architectural feature in one of the greatest improvements in modern times."

The hon. member said that about a month ago they passed a rather singular resolution,—namely, to give 300 guineas to provide a pulpit for the chapel that was being erected on the Viaduct. He opposed that motion. He was defeated on that occasion; but he found that it was intended to repudiate the gift. In the case of the vote of 300 guineas for the erection of a pulpit in the chapel, it was urged that there were some special grounds for that grant. He (Mr. Bedford) said the same special circumstances existed with regard to his proposal, and very much stronger. The hon. member then alluded to the public spirit which had been shown by the parish of St. Sepulchre in throwing a piece of ground into the public way at an expense of over 4,000*l.*, as stated in the resolution, and he asked the Court to come forward, on the same principle on which they came forward a month ago, and pass this motion.

Mr. Stewart moved the "previous question."

Mr. Deputy Horn remarked that, if this motion were carried, he would come and ask for a vote of 1,000*l.* for the restoration of Aldgate Church.

Mr. Shaw remarked that the hon. member had brought forward the motion as a joke.

This Mr. Bedford denied.

On a division, the numbers were equal, thirty voting for and thirty against the motion.

The Lord Mayor said he understood it was his duty to give his casting vote. He should have been glad if the amount had been rather less, but he was in favour of the principle, and he, therefore, gave his casting vote in favour of the motion.

Mr. Rudkin gave notice to move at the next Court that the motion be rescinded.

THIS IS NO JOKE: I AM IN EARNEST!

SIR,—Long and anxiously have I studied the Competition question. Day by day and night by night have I pondered the subject and viewed it by every light known to science and logic, and until the present moment not a ray could I get to penetrate the Cimmerian blackness. Poor young architects, energetic assistants, ambitious pupils, rejoice! I can crush the many-headed monster at a blow. Your own weight added to mine is all I want to make a pancake of the head of this howling abuse. Will you lend it? Yes! Then, Bumbledom and ignorance shall be for ever severed from art. Here is my nostrum. I will subscribe 5*l.* 5*s.* to a fund for awarding premiums for competition drawings. I set myself down as "Nobody." Hence,—

Nobody	£5	5	0
Rest of Profession, "Somebodies"	2,000	0	0
Total.....	£2,005	5	0

The corporation of "Squeeze-'em-Hard-and-Tight" offers 2*l.* 2*s.* for drawings for a "work-*us*" to cost 20,000*l.* Our committee offer 3*l.* 3*s.* for the same, and after selecting the best, sell it to Squeeze'-em-Hard-and-Tight for a just and fair sum.* As our committee can always outbid Squeeze-'em-Hard-and-Tight, consequently Squeeze-em-Hard-and-Tight must knuckle under eventually. According to the present rate of premiums offered, the 2,005*l.* 5*s.* should last ten years. M. U.

NORTHUMBERLAND HOUSE.

SIR,—Surely it is not impossible to elicit an expression of public feeling in favour of retaining Northumberland House. We cannot afford in London to lose so unique an example of its times.

If the following alternative scheme were carried out, it would greatly improve the neighbourhood, and effect the objects in view.

When all the property at the east end of St. James's Park is acquired for the purpose of extending the Government Offices, let that part at the end of the Mall be thrown open to Charing-cross, and remove the Marble Arch from its present somewhat undignified position at Tyburn, re-erect it at the end of the Mall; it would then become the principal entrance to the palace it was intended by its Royal author to adorn, be in close proximity to his equestrian statue, and to the terrace which bears the name of his house; and our dear Queen could then drive *direct* from her palace to *Chère Reine* Cross, to her people to the City, Embankment, &c. Let the entrance to the Embankment be made just opposite, and it will lead by the south-west side of the House, instead of over its site. If necessary, another entrance might be made from the Strand on the other side of the house: it would thus spare an historical monument, and save the finest site in Europe from destruction. A triumphal arcade of three arches could fitly adorn the entrance to the Embankment; and what more appropriate name could be inscribed thereon than that of "Victoria."

A proposal has been made to form a thoroughfare along the inner side of the garden on Embankment, commencing at its east end, terminating at Villiers-street, that would relieve the Strand much if each, street leading to one were opened to the other. Another grand improvement might one day be made which it would assist; viz., a grand street in a straight line; in fact, a continuation of Tottenham-court-road through Seven Dials (where an improved street would join it for Trafalgar-square) to the Embankment, which it would reach somewhere about Cecil-street; so there would then be a noble street, leading direct from the river to the extreme north, namely, to Hampstead.

AGNUS.

* Giving proceeds to successful competitor.

THE FALL OF BUILDINGS IN HULME, MANCHESTER.

AN inquest has been held by the City coroner in this case. The alleged circumstances of the accident have already appeared in the *Builder* of the 1st inst., under the head of "Accidents." The houses were being erected for Mr. Best.

Margaret Best, wife of Samuel Best, of 69, Vine-grove, was one of the witnesses called. She deposed to having noticed that the building was in an unsafe condition two hours before the accident. She cautioned deceased and the other men who were working on the roof of their danger, and begged them to come down. They, however, refused.

J. Taylor, foreman to the contractor, said it was about three weeks from laying the first brick to the time of the fall of the building. The mortar was in every respect as good as that used for cottage property.

J. G. Lynde, city surveyor, said he went round the ruins of the building the morning after the accident. Inspecting some of the mortar, he found it to be well tempered, but apparently crumbly, as if the frost had acted upon it. The thickness of the walls was in accordance with the bye-laws. Some of the bricks used were old ones, and they appeared to have been badly cleaned. Three weeks were too short a time to "run up" the wall in such weather; and, as a practical bricklayer, Powis (the builder) ought to have known this. Witness attributed the fall of the building to the walls having been run up in so short a time in frosty and wet weather, and to the use of old bricks in one of the walls.

The jury returned a verdict of "Accidental death."

CHURCH-BUILDING NEWS.

Rotherfield.—Considerable alterations and improvements have recently been made in the chancel of the church. The whole of the ancient stone pavement has been removed, and tile paving substituted, the alternate tiles of which resemble the typical pelican of the wilderness feeding her young with her own blood. A reredos, carved, in alabaster and marbles, has been erected. This work has been executed by Messrs. Field, Poole, & Sons, of Westminster. The paving and the remainder of the works have been executed by Mr. Aaron Moon, of this town, builder. The whole of the works have been executed from the designs and under the superintendence of Mr. Ralph Neville, architect, Godalming. The walls of the chancel have also been greatly improved in appearance, and brass altar-rails have been added. The expense has been defrayed, we hear, by the rector, the Rev. Alfred Child. Coloured glass in the chancel is much wanted.

Thrapston.—A restoration of the fabric and interior of the Church of St. Peter's, Raunds, will shortly be commenced. Sir Gilbert Scott has undertaken the supervision of the work, which, in consequence of the unsafe state of the whole erection, now becomes an imperative necessity. The estimated cost of the restoration is between 5,000*l.* and 6,000*l.*; and of this, from various sources, about 1,700*l.* have already been promised by the rector and parishioners, and a public subscription-list has also been opened.

Eaton Hastings.—The church of the village of Eaton Hastings, near Faringdon, has been re-opened. The rector, the Rev. F. J. Walker, about a year and a half ago, set an example by restoring and beautifying the chancel at a cost of nearly 200*l.* Since then the people of the parish have taken the matter up with much interest, and the restoration of the whole church has been completed, under the supervision of Mr. Champion, of London, who is the architect employed; Mr. Wheeler, of Faringdon, being the contractor. During the progress of the works an Early English arcade was found blocked up with plaster on the south side; this has been opened out, and the windows reinserted in the wall. The late fourteenth-century doorway on the south side of the nave has been restored, and a new oak door supplies the place of the old one. The works carried out in the restoration scheme consist in opening out the old roof, reseating the nave, the centre passage of which is laid with Godwin's plain tiles; and new glazing, with dark green borders to the windows. The Jacobian pulpit has been lowered, and furnished with new steps and hand-rail. A heating apparatus has been placed in the church. The chief works on the exterior are a new bell-cot of stone, new gable cross, and copings with stone ridge.

Middleton.—The Church of St. Andrew, Middleton-on-the-Wolds, which has undergone a restoration, has been formally opened for divine service. The tower, west front, north wall of nave, and the south porch have been rebuilt; the chancel arch has been widened and heightened; and, by the insertion of windows in the east and west ends, the church presents an open appearance. Beginning with the chancel, the door on the south side has been removed, and the Decorated window close to the chancel arch on this side has been superseded by two lancet windows, to correspond with the others by which the chancel is lighted. There are now four lancet windows on each side, filled with cathedral glass, while in the east end a stained glass window has been inserted, as the gift of Mrs. Blanchard, the mother of the rector, in memory of the Rev. John Blanchard, her husband, and the Rev. John Blanchard, her son. The window, which is of three compartments, contains a great number of subjects, representative of Scriptural types and antitypes, all of which have been executed by Messrs. Lavers, Barraud, & Westlake, of Bloomsbury, at a cost of about 160*l.* The subjects represent types of our Lord and his history, and their fulfilment in the New Testament. In the lower centre is the Lord's Supper, on the north side of which stand Abel and Noah, and on the south side Abraham and Melchizedek. Above these, in a narrow compartment, is a representation of Isaac bearing the wood, surmounted by a figure of our Lord bearing the Cross; the Serpent lifted up in the Wilderness, surmounted by the Crucifixion; Daniel in the Lions' Den; and our Lord being taken down from the Cross. In another narrow compartment are the representations of Joseph being taken up out of the pit surmounted by our Lord's resurrection; Elijah translated to heaven, and the Ascension of Jesus; Moses near the flaming bush; and the Descent of the Holy Ghost at Pentecost. In the upper compartments is represented our Lord in glory surrounded by adoring saints. Above is a small quatrefoil window, also filled with stained glass. The floor of the chancel, which was formerly paved with brick, is now laid with Minton's encaustic tiles, and there are two steps, with a footpace, ascending from the nave to the altar. On the south side, within the altar-rails, is a sedilia, divided by a triple arcade, and beside it is a credence of early date; while in the opposite wall is an old aumbry, where the vessels of the church were formerly kept. It is noticed that the eastern division of the sedilia is wider than the other two, and is probably the seat formerly appropriated by the chief minister of the church. The walls of the edifice are built of Pickering stone, with Ancaster stone dressings, and have been faced on the inside with chalk. The old pews, with high backs, have been superseded by open benches of stained deal, and the floors of the nave, tower, porch, and passages have been paved with Yorkshire flags, in which are inserted iron gratings, in connexion with Haden's patent heating-apparatus. The choir-stalls in the chancel are open in the front, with moulded uprights and cornice. The nave is divided from the aisles by four bays, the pointed arches of which spring from circular pillars, except one near the south entrance, which is octagonal. The aisles are lighted by four double windows on each side, and these also are filled with cathedral glass. The roofs of the nave and chancel, which were formerly underdrawn or plastered, are now of open woodwork, and are constructed of Baltic red wood, stained lightly where exposed. The trusses of the main roofs have arched and moulded ribs, resting on stone corbels, those in the chancel being foliated. The tower, like the rest of the new work, is in the Early Decorated style of architecture, and is about 25 ft. square at the base, and 76 ft. high to the top of the wrought-iron vane. It is built in three stages, with turret stairs in the south-east angle leading to the ringing-loft. Formerly the space underneath the tower was rendered dingy-looking by the lowness of the arch, and the small square window by which it was lighted; but now the arch is lofty, to correspond with that in the chancel, and in the west end a three-light window has been inserted, with coloured border-

ing, the heads of which are filled with enriched tracery. The south porch has been entirely rebuilt, and has stone seats on either side, the gable apex being surmounted by an ornamental stone cross. Outside, the roofs are covered with Welsh Countess slates, and have been raised to what may be considered the original pitch. There are ornamental crosses at the gable ends of both nave and chancel, and the exterior of the tower has been designed after the English village type. The work of restoration, which has occupied about sixteen months, has been carried out under the direction of Mr. J. M. Teale, of Doncaster, architect. Mr. Slater, of York, was the sole contractor, and Mr. Swallowell was the foreman of the work. The total cost of renovating the building was about 2,600*l.*

Eaton Hastings.—The church of this little village has been reopened. It is situated on the banks of the Thames, and is of Early Norman foundation, containing examples of each style up to the fourteenth century. The restoration of the whole church has been completed under the supervision of Mr. Champion, of London, as the architect, Mr. Wheeler, of Farringdon, being the contractor. During the progress of the works an Early English arcade was found blocked up with plaster on the south side; this has been opened out, and the windows re-inserted in the wall. The Late Fourteenth-century doorway, on the south side of the nave, has been restored, and a new oak door supplies the place of the old one. The works carried out in the restoration-scheme consist in opening out the old roof; re-seating the nave, the centre passage of which is laid with Godwin's plain tiles; and new glazing, with dark green borders to the windows. The Jacobian pulpit has been lowered, and furnished with new steps and handrail, and also with a new brass sermon-desk and lights, the gift of a lady. A heating apparatus has been placed in the church. The chief works on the exterior are a new bell-cot of stone, new gable cross, and copings with stone ridge. The work was started with a donation of 100*l.* by the Messrs. Kinch and relatives, and the sum of nearly 150*l.* has been obtained by donations from various sources by the energy of those ladies, who undertook to get together a certain sum.

SCHOOL-BUILDING NEWS.

Godalming.—The low-pitched unsightly brick structure, which composed the old British Schools, has been radically altered and largely added to. The old building has had two stone wings attached to it, and the brick of the old centre has been hidden by a long stone lobby. In the centre of the lobby is the porch, which is carried up in the shape of a round tower, which is ornamented with some decorations in carved freestone. In the tower a bell will be hung. The grey stone of the building is relieved by light-coloured freestone, which is again varied by the window-frames being painted a dark red. The old building, although not actually rebuilt, has been raised. While one wing was being erected, school was held in the old building, and when work was proceeded with on this part, the wing was ready for occupation. The design was by Mr. S. Welman, a local architect, and Mr. Bonner was the cottractor. The tower is not yet completed.

Forest of Dean.—The new national school building committee have decided to build a school for 170 children,—boys, girls, and infants. Grants and promises, amounting to 860*l.*, have been made. Among the subscribers are,—Mr. Crawshay, 100*l.*; Mrs. Crawshay, 50*l.*; Mrs. Wait, 100*l.*; Woods and Forests, 125*l.*; Charity Trustees, 100*l.*

Sheffield.—The second school erected by the Sheffield School Board has been opened. It is situated in Beech Hill-road, Bromhill, and although the smallest school, the Board at present contemplates erecting it as an elementary educational establishment, complete. The building is of Dunford-hill stone, with Grenoside ashlar dressings, and the roofs are covered with blue Welsh slates, capped with red ridge Berkshire tiles, with finials on the angles, according to the special designs of the architects, Messrs. Innocent & Brown. It is erected in the geometric style of Gothic architecture. In front are two lofty gables with triplet windows, with trefoil heads, and segment-headed windows on the ground floor. Over the angle of the building, which is made circular, is a small bell-turret. The school is divided into three departments for boys, girls, and infants. The school for the latter, which is on the ground-floor, is L shaped, and is 50 ft. long by 20 ft. wide. In this room there is a large gallery. Over the infants' school, and extending over the play-sheds behind, are the boys' and girls' schools, each of which is 36 ft. by 20 ft. Each has a class-room 20 ft. by 18 ft., with cloak-rooms and lavatories. Each school is approached by a flight of stone stairs; the entrance to the boys' school being from Beech Hill-road, and the entrance to the girls' and infants' school being on the other side of the building, and approached from the playground. The schools are fitted up with patent desks, and will be warmed by hot water on the high-pressure system, by Messrs. Bacon, of London. They will be lighted with gas. Attention has been paid to the ventilation; plans that have proved successful elsewhere having been adopted. The rooms will accommodate about 300 children. The contract for the building was about 2,300*l.*; but with the fittings and so forth, the cost will probably be 2,500*l.* The contractors were Messrs. Sharp & Son. The mason's work has been done under them by Mr. Butler; the slating and plastering by Harrison & Chadwick; the plumbing by Mr. Thickett; and the painting by Mr. Hunter.

Bridgwater.—The newly-erected Board schools, in the eastern portion of the town of Bridgwater, consisting of three departments—one for boys, another for girls, and a third for infants,—capable of accommodating 600 children, have been formally opened. The cost of the schools, which are built in the vicinity of the railway station, together with their furnishing, amounts to something like 2,800*l.*, which amount has been advanced as a loan by the Public Works Commissioners, the repayment extending over fifty years. The architect was Mr. John Mountford Hay; and the builders were Messrs. Harvey & Sons, of Torquay.

Ringley.—New Church of England schools at Ringley have been opened. The style of the new building is Gothic. The materials of the construction are bricks, with stock brick facings and stone dressings. The walls of the rooms internally are tinted in two colours with stencil ornaments. The timbers of the large room are of pitch pine, varnished, as is all the joiners' work throughout. The site occupied for the schools and playgrounds comprises half an acre, and has been given by Lord Derby. The masonry and brickwork have been done by Messrs. J. & S. Hall, of Bury; the joiners' work is by Mr. J. Allen, of Radcliffe; the slating by Mr. F. Murphy, of Bury; and the plumbing, gasfitting, plastering, &c., were executed by Messrs. Leach & Son, of Bury. The architects are Messrs. Maxwell & Tuke, of Bury.

VARIORUM.

THE "Agricultural Returns of Great Britain, with abstract Returns for the United Kingdom, British Possessions, and Foreign Countries, 1872," just now published, show that the total extent of land returned in 1872 as being under all kinds of crops, bare fallow, and grass was 31,004,173 acres in Great Britain, 15,746,547 acres in Ireland, 88,573 acres in the Isle of Man, 18,026 acres in the island of Jersey, and 12,007 acres in the islands of Guernsey, Alderney, &c., making a total for the United Kingdom of 46,869,326 acres. Although exact figures cannot at present be given, the results exhibited in the Returns indicate that an addition is annually made to the land under cultivation in Great Britain. The reclamation of waste land is mentioned by the collecting officers in many parts of the country, as one of the causes of the increase of the acreage returned in their districts. "How many of the population were directly employed in agriculture in 1871 is not as yet known, but, when ascertained, the number will probably not differ materially from that shown by the census of 1861. At that time (including farmers, graziers, farm bailiffs, indoor farm servants, shepherds, and agricultural labourers) about 1,590,000 persons of both sexes were employed in agriculture in Great Britain, or 6 per cent. of the total population in 1871. This number, in proportion to 31,000,000 acres, the total quantity of land returned as under cultivation in 1872, would show that a little more than five persons, on an average, were employed upon every 100 acres of land. It would, therefore, require a large quantity of additional land to afford employment, at this rate, to any considerable portion of the numbers yearly added to the resident population of Great Britain." We should prefer to see a different deduction from this. How many more persons might profitably be employed on an acre.——A writer in *Iron* gives these particulars as to the *measurement of the velocity of light*:—"The velocity of the transmission or propagation of light, as now generally accepted (192,000 miles per second), was originally determined by astronomical observation, based on the solar parallax, namely, 8·58", augmented by more recent calculation to 8·75" or 8·92". M. Fizeau has recently introduced a mechanical method of exact determination by direct observation of the duration of a double journey indicated by reflection; the principle being that of a toothed wheel, caused to rotate with great velocity (700 or 800 revolutions per second), and effecting records electrically by means of a cam and suitable mechanism. A brake for regulating the speed and reversing gear are also accessories of the apparatus. M. A. Cornu, in a communication to the French Academy, gives the results of more than a thousand observations, of which two-thirds at least were made under satisfactory and trustworthy conditions. The distance between the stations of observation was carefully and accurately measured and determined by triangulation, and found to be 10,310 mètres, with a possible error of 10 mètres, or the one-thousandth part. The resulting mean gave 298,500 kilomètres (185,483 miles) per second, as the velocity of light *in vacuo*; closely, according with the values assigned by MM. Foucault and Le Verrier, and corresponding to the solar parallax, 8·86". M. Cornu estimates the possible error at 1-300th, and considers that with stations 20 to 30 kilomètres apart (12 to 20 miles), an approximation to within less than the thousandth part may be obtained; for the realisation whereof he urges the active co-operation of the Academy, so that this grand work, "commenced by Rœmer at the Paris Observatory, simplified and continued by French *savants*," may be perfected with precision by France."

Miscellanea.

Oxford Architectural and Historical Society.—The members of this society held their first meeting for the Lent Term in the hall of Oriel College, where they were received by the Rev. the Provost. The Provost first drew attention to the pictures, and referred to the peculiar construction of the hall, which had, from the height of the screens, the appearance of having been a small room under a large one. The name of the college he said came from an oriel window over a doorway which was in the building purchased by Dr. Broome, and that they knew from documents in the possession of the college actually referring to it. The first meeting of the society during the present term was held in the lower room of the Taylor Building. Several gentlemen were elected members of the society, and the names of others were submitted to be balloted for at the next meeting. Mr. Trevor Fielder, of St. John's, read a long paper on Lanthony, in the vale of Ewyas, Monmouthshire. A chronicler living in the twelfth century, who described himself as a monk of Lanthony, when writing of the chapel which St. David erected on the spot which was afterwards occupied by the Abbey, described it as "a poor building surrounded with moss and ivy, covered with thickets, scarcely habitable for man or for beast." The lecturer gave some architectural descriptions of the ruins, and after tracing the possession of the property from 1809, he stated that about four miles north of the Abbey stood the building a short time back erected by "Father Ignatius," who destined it, when the funds were sufficient, to become a large monastery in exact imitation of those which flourished under the rule of St. Benedict, in the tenth and eleventh centuries, but at present the establishment was very small. Mr. W. Scott Champion, of London, architect, then read a paper on North Stoke Church, Oxfordshire, and illustrated it by numerous drawings and plans. On Thursday, March 20th, a communication will be made on the Utrecht Psalter, with especial reference to the recent controversy, by Professor Westwood; and a report will be read on Archæological Discoveries, &c., in the neighbourhood of Oxford during the past year.

Protection of Passengers.—A builder has been fined 3*l.* and costs at the Westminster Police-court for neglecting and refusing to put up a fan to his hoarding at the corner of two streets in South Belgravia.

Opening of a New Saw-Mill in Hereford.—A new saw-mill has been erected within the precincts of the city of Hereford, according to the local *Journal*. The building is at the Canal Wharf, and has been erected by the executor of the late Mr. E. George (Mr. W. A. Hill). The erection, which is 50 ft. in length by 40 ft. in width, was designed by Mr. Henry Lee, C.E., of Birmingham, and has been built by Mr. Hudson, of Hereford, builder. The engine, which was made by Messrs. Davey & Paxman, of Colchester, is of 10-horse power (nominal). It is of the type known as vertical, with boiler combined, the boiler being on the makers' new principle of bent taper tubes through the fire-box, with mushroom deflectors, by means of which rapid circulation of water and generation of steam are produced at a very small cost for fuel. The engine was exhibited at the International Exhibition last year, and used for driving a portion of the machinery in motion. The sawing machinery was supplied by Messrs. Robinson & Son, of Rochdale, and consists of a deal frame for sawing by vertical action; one large circular saw-bench, with self-acting motion for bringing the timber forward; and a smaller bench for cross-cutting, grooving, tongueing, rebating, boring, &c. Mr. Hill arranged and superintended the fixing of the whole of the machinery. A supper was held to celebrate the accomplishment of the work: Mr. W. A. Hill took the chair, and Mr. E. George officiated as vice-chairman. The party included Mr. Tudor (clerk), the sawyers and labourers employed by the firm, Mr. Wham (representative of Messrs. Davey & Paxman), Mr. Hudson (the builder), and his workmen, together with a few visitors and friends.

The New Library at Guildhall.—The new library and museum at Guildhall, erected by the Corporation of London, have been opened for the free use of the public, and during the first day between 400 and 500 people visited them. The library itself contains accommodation for between fifty and sixty readers at a time, and one of the twelve bays into which it is divided is set apart for ladies. There are between 30,000 and 40,000 volumes on the shelves, and the library abounds especially with works referring to the history and the traditions of the City. There is also a public reading-room, where dictionaries, directories, guide-books, maps, atlases, and commercial and legal works are kept for quick reference. The building will be open daily from ten until five throughout the year, except on holidays. Each reader is required to give his or her name and address on entering the room, and the way in which books are obtained and returned is exactly similar to that at the British Museum. Children under fourteen years of age, and intoxicated and disorderly persons, are inadmissible. A new catalogue has not yet been compiled, but Mr. Overall, the librarian, has for the present re-arranged and re-numbered the old one. This is the first experiment of a free library ever made in the City. The committee are considering whether to open the building during the evening, and also to form a circulating branch of the library. We hope both objects will be achieved.

Fatal Sewer Accident near Brighton.—An inquest has been held on the body of John Pinch, aged eighteen, whose death had resulted from his falling down a shaft (96 ft. deep) at Ballard's Bottom, in the parish of Telscombe, where deceased and others were engaged in carrying out works connected with the Brighton intercepting sewer. Deceased, it appears, was oiling some portion of the machinery, when, in turning round, his foot slipped on some planks that covered a portion of the shaft, and he fell down an opening between them. He caught at the skip for supplying the engine with water, but this gave way, or he might possibly have saved himself. He went down feet first, striking against some woodwork twice in his descent. When drawn up and taken to the hospital he was conscious, but died in a few hours. Deceased was perfectly sober; and it was shown that the opening through which he fell could not be protected, the space being left for the skip to pass through. The jury returned a verdict of "Accidental death."

Burlington House.—The temporary entrance in Piccadilly to the house of the Royal Academy has been removed, and carriages will now drive through the archway in the new building for the learned societies, and set down at the steps of Burlington House.

Proposed Graving Dock and Jetties on the Tees.—The Commissioners of the Tees Conservancy are about to construct a new graving-dock, between the works of Jones, Dunning, & Co. and Normanby Jetty. This will be the first and only dock of its kind on the River Tees. The statutory notices have been given for the occupation of the land, and building operations are to be commenced in the course of next summer. The estimated cost of the new dock is about 30,000*l*. It is also intended to construct two new jetties on the river below Cargo Fleet. One projected by Mr. Vaughan will be the largest on the river. Its length will be about 700 yards, and it will have a frontage to the Tees of 360 ft. One result of their erection will be to diminish the value of the trade of the docks at Middlesbrough and Lackenby. At the present time the North-Eastern Railway Company charge a duty of 1s. per ton for conveying iron to the docks from either the Eston or the Cargo Fleet works; and there are dock-dues to be provided for over and above this sum. By the use of their own jetties ironmasters avoid these payments altogether. Another effect of the new jetties will be the partial discontinuance of the Normanby Jetty, belonging to the North-Eastern Railway Company, from which the owners of the proposed new jetties have hitherto been accustomed to ship a considerable part of their iron. Other new works are being promoted below Eston.

New Buildings at Elland.—On the north side of the Elland and Brighouse-road, near to "Woodlands," the residence of Mr. Dewhirst, is about to be erected one of the largest mills in the district, to be worked as a worsted manufactory. The building will be 75 yards long by 20 yards wide, and four stories high, and at each end will be a campanile clock tower with a dome roof. At one end will be a separate building to hold four boilers, and the machinery will be turned by a powerful 60-horse compound engine, now being made at the works of Messrs. Pollitt & Wigzell, of Sowerby Bridge. The whole building will be made fire-proof. The building will be erected for Mr. Dewhirst from plans drawn by Mr. T. W. Helliwell, of Brighouse, architect. The tenders have been let, and operations have already commenced, the stonework being let to Mr. Geo. Hanson, of Elland; the joiners' work to Messrs. Hirst & Wilson; the cast-iron work and shafting to Messrs. Berry & Son, of Halifax; and the slaters' work to Mr. J. Bancroft, of Halifax. The chimney will be square and ornamental, and 45 yards high. The two largest malt-kilns in the district are also being built from plans by Mr. Helliwell.

The Site of Troy.—At a meeting of the Society of Antiquaries, under the presidency of Lord Stanhope, a paper on "The Troad" has been read by Sir John Lubbock, M.P. He stated that he had spent his holiday last year in paying a visit to Constantinople, and from Constantinople he had sailed to the plains of Troy, landing close to the tumulus of Ajax. The balance of opinion as to the true site of the city of Troy, he thought, was clearly divided between Bunarbashi and Hissarlik. The rival claims rested principally in the distance of these places from the sea and the courses of the rivers, but all theories suggested on these points were open to grave objections. No site could be said to accord thoroughly with the account given by Homer, and the examination of the tumuli threw little light upon the matter. Admiral Spratt said he had made the visit to the Troad thirty years ago, with Homer in his hand. With regard to the distance from the sea, Pliny and Strabo had both placed Troy at the distance of 12 stadii (about an English mile). Though it was now nine miles, there was nothing incompatible in this, as the sea had been retiring ever since the Trojan war, and placing more and more land between the city and the sea.

Increase of Salary to the Town Surveyor of Great Yarmouth.—Mr. H. H. Baker, the Yarmouth town surveyor, having applied for an increase of salary, the committee appointed to consider the subject recommended that his salary should be advanced from 200*l*. to 310*l*. per annum; namely, as surveyor to the sanitary authority, 120*l*.; town council, 180*l*.; and inspector of gas-meters, 10*l*.; the surveyor to keep a pony and gig at his own expense. Objection was taken to the necessity of the surveyor keeping a pony and gig; but it was finally resolved that the salary should be 310*l*., and that it should be obligatory on the surveyor to keep a pony and gig.

Medical Officers of Health and the Public Health Bill.—At the annual meeting of the Poor-law Medical Officers' Association, Dr. Rogers presiding, Dr. Lush, M.P., was unanimously appointed president of the association for the ensuing year. The following resolutions were passed:—"That the opinion of this meeting is adverse to the amalgamation of large sanitary districts, and considers that the Public Health Act would be best carried out by appointing medical officers for their own districts, where possible, as health officers." "That this association entertains a strong opinion that the establishment of public dispensaries, in accordance with the recommendation of the Sanitary Commission and the Poor-law inspectors' special report, is necessary and desirable, and earnestly hopes that the Government, notwithstanding their avowed intention of introducing no measure in the present session of Parliament affecting the sanitary requirements of the country, may be advised, in view of the great distress among all classes of the poor, in a time of exceptional severity, to pass some measure having for its object the prompt and efficacious relief of sickness."

Carlisle Public Hall.—The local journal says that of the various plans sent in for the proposed new public hall for this city, those of "St. Swithin" (Mr. D. Birkett, Carlisle), and "May Carlisle Flourish" (Messrs. Habershon & Brock, London), are those approved of most by the committee. The two sets have been submitted to the inspection of Mr. Cory, the county surveyor, who has reported in favour of Mr. Birkett's plans. At the same time, he has informed the committee that, in the present state of the labour market, and with the current rates of materials, he does not think either of the two competing plans could be executed for less than 10,000*l*. The expenditure contemplated by the committee upon the building is 4,500*l*., and we believe that both sets will be referred back to the architects for reconsideration of estimates, and future action must depend upon their replies; but it seems probable that part of the design will have to be abandoned, and the scope of the project restricted to the building of a large hall with suitable approaches and conveniences.

Newcastle Society of Antiquaries.—The usual monthly meeting of the Newcastle Society of Antiquaries was held in the old Castle, Mr. R. Carr-Ellison in the chair. The chairman presented to the society a very old axe-head, which he had received in a peculiar manner. He remarked that Mr. Crisp, of Pendwick, in the parish of Alnham, observed one day recently his blacksmith holding the axe-head in the fire. He saw that there were some cross figures upon it, and requested the blacksmith to take it out again. It then appeared that it had been bought amongst a quantity of scrap from a travelling dealer. There was the figure of a crown on the axe, which was worn, but left the impression that it had once been a headsman's axe used under the authority of the Crown. The secretary, (Mr. Longstaffe), had a copy of Sir John Lubbock's Bill for the preservation of antiquities, and on the motion of Dr. Bruce, seconded by the Rev. Mr. Adamson, it was agreed to petition in its favour.

The Late Mr. A. S. Newman.—We have to announce the death of Mr. A. S. Newman, surveyor to the Board of Works for the St. Olave District, Southwark. The *Metropolitan* says the Commissioners of Paving for the East Division of Southwark were superseded by the St. Olave's Board, on the passing of the Metropolis Local Management Act, 1855. The late Mr. A. S. Newman had assisted his father, who was the surveyor to the Commissioners. The St. Olave Board, however, appointed the late Mr. A. S. Newman their surveyor, and superannuated the father. Mr. Newman held the appointment until his death. We may add that the members of the St. Olave Board always had the greatest confidence in their late surveyor, and much regret his early death.

The New Infirmary for Chelsea.—In consequence of an interview with Mr. Langley, of the Local Government Board, the guardians of the parish of Chelsea have decided to increase the accommodation of their new infirmary, from 200 to 300 patients. Plans have been submitted by their architects, Messrs. John Giles & Gough, of Craven-street. These additional patients can be provided for at a cost of about 22*l*. per patient, so far as the buildings are concerned.

New Method of Forecasting Storms.—A letter by Mr. G. Wenley, of Chelmsford, on a "New Method of Forecasting Storms," has been reprinted from the *Chelmsford Chronicle* of March 7, 1873. We have not sufficient space to explain the drift of this letter, which must itself be read by those interested in the subject, but we may give a brief quotation :—

"The plan I have adopted for learning the form of aërial wave which is passing over any given place is to take a sheet of paper ruled with perpendicular lines (a sheet of ordinary foolscap ruled with horizontol lines only, and turned on its edge so that the lines are upright, answers admirably for a monthly register); now draw a strong black line across the middle of such a sheet to represent the average or mean line of the barometer, and fifteen finer lines above and below at intervals of about one-sixth of an inch (each interval is to represent one-tenth of an inch rise or fall); then, having dated the lines at the top, to correspond with the days of the month, begin by noticing how many tenths of an inch the mercury may stand (say at eight a.m.) above or below the average, or 29½ in.; make a dot in the line corresponding to the date at the required height, do the same thing the next day at same hour, drawing a pen across from dot to dot; continuing this daily will give the wave-form. In practice I find it far better to mark it twice a day,—viz., at eight p.m., halfway between the daily lines; a sailor might mark it every watch."

"The aërial wave," adds the writer, "follows the same law as the watery one: that if a great height be suddenly reached, it will be as suddenly left; if slowly reached, as slowly quitted. It will also be seen that our most dangerous gales are in many cases preceded by periods of exceptionally fine weather, but too apt to throw the sailor off his guard, and of this no one has yet warned him, so far as I know and believe."

Extension of Dundee Harbour.—In accordance with the request of the Dundee Harbour trustees, Mr. Harrison, C.E., has prepared a report and plan of a large scheme of harbour extension, in order to make the accommodation ample, and to prevent the large annual expense of dredging to keep the accesses to the present docks clear. With this view, Mr. Harrison proposes to construct a wall from the outer bend of the esplanade to the Beacon Rocks, and from thence to the Stannergate. This wall, he proposes should be built of concrete, and founded at a great depth, and, when finished, it would be about two miles in length. Within this wall 250 acres of space would be enclosed, which would be allocated to new basins, docks, timber ponds, quays, sites for warehouses, &c. The structural cost of the new works is estimated at 450,000*l.*, exclusive of filling up ground by the dredger for the next ninety years.

Method of Cleaning Glassware, by Dr. I. Walz.—The cleaning of beakers and other chemical glassware that have contained oils, fats, and similar organic matters, by means of potassium bichromate and concentrated sulphuric acid, is often inconvenient on account of the shape of the vessels, or because sometimes requiring the application of considerable heat, and thus causing breakage. The following method has given me uniformly satisfactory results :—The vessel to be cleaned is filled, or, if large, rinsed with a moderately dilute solution of potassium permanganate, the contact of the liquid being prolonged till a film of hydrated manganic oxide has been deposited; the solution is then poured away, and the glass vessel rinsed with some strong hydrochloric acid. Chlorine is then formed, but not enough to cause inconvenience; and acting *in the nascent state* on the organic matter, it speedily converts them into substitution products, that are soluble in the slight excess of acid or water.

A New Household Fuel Economiser.—Mr. Mark Shepherd, of Bradford, has invented a simple and effective improvement by which an ordinary open kitchen-range may be converted into an approximation to an American cooking stove. His arrangement consists of a cast-iron plate covering in the top of the fireplace, another plate closing up the mouth of the chimney, and a connecting-pipe passing through both plates for a chimney. The plate over the fire is provided with holes for cooking utensils after the manner of the American stoves, and the chimney-pipe has a valve in it to act as a damper. The inventor claims for his stove all the advantages of the American stove, together with cheapness and adaptability to ordinary ranges.

Mr. and Mrs. German Reed's Entertainment.—A new entertainment, written by Mr. F. C. Burnand, with music by Mr. J. L. Molloy, is in preparation, and will be produced at an early date, we presume in the place of "Happy Arcadia," which has now reached its 140th representation.

Search for Coal in the North of Europe. Seams of coal, according to a Copenhagen correspondent, have been discovered in the south of Sweden, and several companies have been, or are being, formed to work them. One of the companies commenced operations on the 21st of January, under the direction of an English engineer. A circular has been issued by Stockholm capitalists for the formation of a company to work the mines, which are near Engelholm, to the south-west of Scania. The capital is fixed at nine millions of Swedish crowns, mostly subscribed. An Anglo-Swedish society has been formed in London, to purchase, for 190,000*l.*, 7,000 acres of coal country in Scania. Borings for coal have been also made in Denmark, but without success. In the island of Bernholm it has been found, but the quality is inferior. There are coal-beds in Jutland, and the search for new mines is being prosecuted in the Island of Forse.

The Iron and Coal Trades.—Circulars from makers of the best sheet-iron have been issued in South Staffordshire, announcing a new rise of 2*l.* a ton. Wilden B singles are now 21*l.*, and B charcoal 28*l.* Cookley bars are advanced to 15*l.* 10*s.* These makers have to give unprecedented prices for their raw material. Charcoal has advanced 100 per cent. Those japanners who advanced their prices after the recent excitement are now advancing them again, owing to the dearness of the fuel.——The *Glasgow Herald* learns that short time is to be adopted by one or two mills in the city this week, owing to the high price of coal. Our contemporary further states that from nearly all the manufacturing districts both north and south of the Tweed come reports of a gradual curtailment of production, and, as contracts run out, of large portions of machinery being thrown idle.

Society of Biblical Archæology.—At the last meeting a paper "On the Synchronous History of Assyria and Babylonia, translated from the Cuneiform Inscriptions," by the Rev. A. H. Sayce, M.A., was read. This most ancient historical document, which unfortunately exists in a very fragmentary condition, is a chronological history of the two kingdoms of Assyria and Babylonia from the fifteenth to the seventh centuries B.C.; from the time of Karaindas to that of Shalmanaser, with whose invasion of Babylonia the record ends, and whose famous black marble obelisk is now in the British Museum. Mr. Sayce accompanied his translation with numerous historical and philological comments, and promised to translate some further historical tablets on another occasion. A discussion ensued, in which M. Lenonnant, Dr. Birch, Professor Donaldson, and Mr. R. Cull, F.S.A., took part.

Proposed County College at Cambridge.—A meeting of gentlemen interested in the establishment of a County College, at Cambridge, has been held at the Guildhall. In the unavoidable absence of the mayor, Professor Liveing took the chair. A memorandum of association was read and approved. One of the articles of the memorandum states the object of the association to be :—

"To combine and assist certain efforts that are being made in the various counties of England to extend and raise the standard of middle-class education, and for that purpose to purchase and hold and occupy requisite buildings at Cambridge or elsewhere, and to erect thereon one or more college or colleges upon a proprietary basis."

The company will be registered under the Limited Liability Acts, and its capital is to be 30,000*l.*, in three thousand shares of 10*l.* each. A number of shares were at once taken up.

Overcrowding in Lambeth.—A report, prepared by a special committee of the vestry of Lambeth, in relation to "proposed regulations for houses sub-let in lodgings, or occupied by members of more than one family," was brought up to the vestry on the 13th of February, 1872. It was then ordered to be printed and taken into consideration in a twelvemonth. The twelvemonth having expired, the report was considered at the meeting of the vestry on Thursday. There are a series of fifteen proposed regulations, as to cubic space, whitewashing walls, cleansing, water, sleeping arrangements, &c. The consideration of the subject was deferred. There is much difference of opinion in the vestry on the subject.

Architects' Benevolent Society.—The annual meeting of the society was held on Wednesday, the 12th instant, the president, Mr. S. Smirke, R.A., in the chair. We will give particulars in our next.

The Durham Architectural and Archæological Society of Northumberland and Durham.—The annual meeting of this society was held in Bishop Cosin's Library, Durham, the Rev. W. Greenwell presiding. The financial statement was read by Mr. R. J. Johnson, and showed a balance in hand of 56*l.* 10*s.* 3*d.* The chairman then gave a *resumé* of the proceedings of the society during the past year. It was then agreed that the places to be visited by the society during the forthcoming year be as follows :—1. Norton, Redmarshal, and Bishopton; 2. Ryton and Newcastle; 3. Dinsdale, Sockburn, and Eryholme; 4. Rothbury, Eglingham, and Casterton Castle. A fifth visit of two days was projected to Selby, Howden, and Beverley, in Yorkshire.

Clerkenwell Workhouse.—The Guardians of the Holborn Union requested their architect, Mr. H. Saxon Snell, to prepare a design for rebuilding this workhouse, in consequence of the present building being in so decayed a state that a large quantity of timber shoring is necessary for its support. Plans for the accommodation of 500 inmates were accordingly submitted for the approval of the Local Government Board, at an estimated cost of 20,000*l.*; but they have requested the Guardians to refrain from building here until the St. Luke's Workhouse, also belonging to the Union, has been rebuilt.

Vapour Stove.—A new article from America is being sold in Liverpool, for use either in cooking or in heating apartments. It seems better suited for summer use in cooking, however, on a small scale, than for warming in cold weather, unless it be for bed-rooms. It is called a gas-stove, but the gas is produced in the stove itself, and seems to be a modification of mineral oil into vapour: hence the name of "Vapour-stove." It is the subject of a patent. The cost of the fuel is said to be not more than one halfpenny an hour, and the stove is quite portable even while burning.

Consulting Engineer at Yarmouth.—In consequence of the death of Mr. J. Cubitt, C.E., the office of consulting engineer to the Great Yarmouth Port and Harbour Commissioners became vacant, and Sir John Coode has been appointed consulting engineer to the Commission. The clerk has been instructed to forward the resolution of the Board to Sir John Coode, and to request him, in the event of his acceptance of the appointment, to attend at Yarmouth, and inspect the injury done to the harbour works to the north and south of the pier.

Baptist Church and Schools, Prince's-end, Tipton.—This church and schools have just been completed and opened. The buildings are of red brick, with Hollington stone dressings and traceried windows, and have been carried out by Mr. George Haffner, builder, of Tipton, from the designs and under the superintendence of Messrs. Weller & Proud, architects, of Wolverhampton. The church will seat 700; and the schools will accommodate 500 children.

New Townhall for Paisley.—The late Mr G. A. Clark, a partner of the firm of Messrs. J. & J. Clark & Co., thread manufacturers, Paisley, who died at Newark, New Jersey, United States, on the 13th of February, has left 20,000*l.* for the erection of a new townhall in Paisley. The hall is to have combined with it a reading-room for working men, where they can sit in comfort and enjoy smoking, and is to be open from five o'clock in the morning till twelve at night.

Frome Market Competitions.—At a meeting of the committee of the Frome District Agricultural Society last week, Mr. H. P. Jones presiding, it was decided to award the first premium of 20*l.*, for the best set of plans for the new market at Frome, to Mr. W. J. Stent, architect, of Warminster; and the second, of 5*l.*, to Messrs. Wilson, Willcox, & Wilson, architects, of Bath. The proposed cost of the works is 4,000*l.*

Artists' Benevolent Fund.—The annual general meeting of this fund will be held at the Freemasons' Tavern on the 20th instant, at two o'clock. The Dean of Westminster will take the chair at the anniversary dinner of this fund on or about the 24th of May.

Royal Architectural Museum. — The Council announce that Mr. Thomas Peard has promised Two Addresses in the Museum, on the "Art of Producing Artistic Ironwork," on the following Saturdays, at 3·15 p.m.:—March 15 and March 22. Admission free (without ticket), on entering names in the visitors' book in the Museum.

TENDERS

For the erection of a house at Totteridge, for Mr. J. Robertson. Mr. Thomas W. Willis, architect :—

Carter	£1,257 0 0
Rist & Brown	1,252 0 0
Willett	1,145 0 0
Gilmour	1,110 0 0
McGowan	1,035 0 0
Woodhall	987 0 0

For additions to Morton House, Kingsworthy, and new stables and lodge, for Mr. Aitcheson Gray. Mr. John Colson, architect :—

Vokes & Son	£3,180 0 0
Brinton & Bone	3,120 0 0
Quick	3,076 0 0
Sickley & Co.	2,974 10 0
Newman & Son	2,969 0 0
Birch	2,920 0 0
Dugay	2,840 0 0
Carter	2,797 0 0
Ripley & Son	2,790 0 0
Crook	2,710 0 0
Maklin	2,700 0 0
Bull & Sons	2,699 0 0

For new school, out-buildings, fence walling, and master's house, for the trustees of the Mirfield Endowed School. Mr. John Banks, architect :—

	Contract No. 1. School.	Contract No. 2. Outbuildings and Fence Walling.	Contract No. 3. Master's House.
	Mason.		
Furniss	£263 0 0	£131 0 0	£349 6 0
	Joiner.		
Smith	178 5 0	17 5 0	200 16 0
	Slater.		
Denton	55 15 6		35 15 0
	Plumber.		
McKinnell	39 5 0		53 12 0
	Plasterer.		
Shaw	10 12 6	2 16 6	57 19 0
	Painter.		
Whiteley	9 5 0	0 15 0	15 0 0

Tenders for Contracts Nos. 1 and 2 only accepted.

For warehouse and shopping, Freeman-street, Birmingham, for Messrs. Hassall & Singleton, Ironfounders and Engineers. Quantities supplied. Mr. W. Hale, architect :—

Charley	£1,290 0 0
Parker & Son	1,235 0 0
Parton	1,235 0 0
Barnsley & Sons	1,228 0 0
Jefferey & Pritchard	1,200 0 0
Partridge	1,200 0 0
Matthews	1,197 0 0
Bennett	1,195 0 0
Wilson & Son	1,195 0 0
Moffat	1,193 15 0
Swiman & Son	1,190 0 0
Barker & Son	1,155 0 0
Ravenscroft & Son	1,155 0 0
Davies, Brothers	1,125 0 0
Preece	1,079 0 0
Horsley, Brothers (accepted)	1,075 0 0

For alterations and additions to Gloucester House, Finchley, for Mr. Crawley. Mr. F. Chamberlain, architect :—

Scrivener	£370 0 0
Morris	334 14 0
Walton	319 0 0
Gilmour	300 0 0
Donno	200 0 0

For new illuminating dials to parish church clock, Limehouse. Messrs. A. & C. Harston, architects :—

Blundell & Sons (accepted)	£750 0 0

For the erection of malthouse at Farndon Field, near Newark-upon-Trent, in the county of Nottingham, for Mr. Joseph Richardson. Mr. Charles Baily, architect :—

Fretwell (accepted)	£7,700 0 0

For new tramp cells, receiving-wards, and porter's lodge, at the workhouse, Bletchingley, Godstone. Mr. Alex. R. Stenning, architect. Quantities by Mr. R. W. Gritten :—

Anscombe	£1,678 0 0
Cook	1,673 16 0
Coles	1,645 0 0
Crossley	1,635 0 0
Smethurst	1,567 0 0
Wallis & Son	1,518 6 6
Woodward	1,500 0 0
Jarrett	1,480 0 0
Sutton	1,450 0 0
Hickinbotham	1,440 0 0
Lacy	1,401 0 0
Worsell	1,375 0 0
Galyer	1,350 0 0
Morris	1,332 0 0
Wright, Brothers, & Goodchild	1,325 0 0
Engineer's Work.	
May	201 13 0
Rosser & Russel	197 5 0
Clark (too late)	193 7 0
Fraser, Brothers (hot water only)	170 0 0
Dye	147 1 3

For rebuilding 39, Foster-lane, Cheapside, for Messrs. M. & N. Salaman. Mr. B. Tabberer, architect. Quantities by Messrs. Franklin & Andrews :—

Perry, Brothers	£2,010 0 0
Brown & Robinson	1,995 0 0
Henshaw	1,945 0 0
Downs	1,926 0 0
Turner & Sons	1,915 0 0
Merritt & Ashby	1,902 0 0
Pritchard	1,883 0 0
Mark	1,817 0 0

For alteration and repairs to No. 4, Montague-square, for Major-General Moore :—

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